

# ALS Integrated Safety Management Plan

Advanced Light Source Division

Ernest Orlando Lawrence Berkeley National Laboratory

## **Advanced Light Source Integrated Safety Management Plan**

### **I. Introduction**

The ALS Integrated Safety Management (ISM) Plan has been written to implement the Integrated Safety Management System (ISMS) for the division. The ISMS, taken from DOE 450.4, Safety Management Policy, sets forth 7 principles and 5 core work functions. This plan articulates those principles and core work functions specifically for the ALS Division. The Laboratory's ES&H policies and requirements are established in the RPM, Pub 3000, and the OAP. These publications establish line management responsibilities and define authorities and authorizations. The ISM Plan, referred to as the Plan, establishes the fundamental management strategy that will ensure that all institutional Environment, Safety and Health policies and procedures are implemented. The Plan will be reviewed annually as part of the Division's self assessment report. Based on management line management input, assessments, occurrences, lessons learned and other feedback mechanisms, the Plan will be modified as necessary to assure that ES&H continues to be effectively implemented within the Division.

### **II. Institutional Guiding Principles & Core EH&S Functions**

The Ernest Orlando Lawrence Berkeley National Laboratory is a national resource, located on land belonging to the Regents of the University of California and operated with funds furnished mostly by the U. S. Department of Energy. The staff and management of the Berkeley Lab have been entrusted to function as stewards of this national resource. As stewards of this public trust, the staff and management must protect the public's interest and investment in the people, the land and environment, the equipment and facilities, and the intellectual property that make up the Berkeley Lab. This stewardship includes a responsibility to protect the health of the public and the workers, and to maintain the confidence of Congress, the public in general, and the people who work at the Laboratory.

In light of this responsibility, the Berkeley Lab commits itself to perform all work safely, in a manner that strives for the highest degree of protection for employees, participating guests, visitors, subcontractors, the public, and the environment, commensurate with the nature and scale of the work. In the context of this plan, safety refers to all environment, health and safety considerations. In addition, the Berkeley Lab seeks continuous improvement or sustained excellence in the quality of all environment, health and safety efforts. To achieve these goals, the Berkeley Lab has adopted the following principles, which are reflected in the detailed policies and procedures of the Laboratory. Principal investigators, managers and supervisors are expected to incorporate these principles into the management of their work activities. While these principles apply to all work, the exact implementation of these principles is flexible and can be tailored to the complexity of the work and the severity of the hazards and environmental risks.

1. Line Management Responsibility for EH&S. Line management is responsible for the protection of the public, the workers, and the environment. More specifically, Laboratory line managers are responsible for integrating ES&H into work and for ensuring active communication up and down the management line and with the workforce.
2. Clear Roles and Responsibilities. Clear and unambiguous lines of authority and responsibility for ensuring EH&S are established and maintained at all organizational levels within the Laboratory, and for work performed by its contractors. At the Berkeley Lab, this principle is manifested in contract language, position descriptions, P2R reviews and work authorization documents.
3. Competence Commensurate with Responsibilities. Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities. Berkeley Lab management takes steps to ensure the appropriate depth and breadth of technical talent in EH&S is available and that the Laboratory has in place the means for periodically evaluating competencies. Competence includes training, experience and fitness for duty.

4. Balanced Priorities. Resources are effectively allocated to address EH&S, programmatic, and operational considerations. Protecting the public, workers, and the environment is a priority whenever activities are planned and performed.
5. Identification of EH&S Standards and Requirements. Before work is performed, the associated hazards are evaluated and an agreed upon set of standards and requirements are established which, if properly implemented, provide adequate assurance that the public, workers and the environment are protected from adverse consequences. At the Berkeley Lab this is accomplished through periodic review of the agreed upon set of standards developed using the Work Smart Standards protocol. Results of Self-Assessment roll-ups, planned EH&S Division reviews and other independent or external reviews will be considered during this review. The appropriateness of the current standards set will be established at least annually.
6. Hazard Controls Tailored to Work Being Performed. Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards being performed. The Berkeley Lab recognizes that tailoring requires judgment to be exercised at the appropriate decision level.
7. Operations Authorization. The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed upon. Chapter six of PUB-3000 outlines a method for ensuring the form and content of authorizations. Examples for the Berkeley Lab include Radiation Work Authorizations (RWAs) and Activity Hazard Documents (AHDs), Safety Analysis Document (SAD) for the NTLF and HWHF, etc. another form of authorization that exists for the Lab is the site-wide Environmental Impact Report (EIR). The Lab conducts an EIR review during renewal of the 5-year ODE/UC Contract.

These Guiding Principles are implemented through the following Core EH&S Functions, which must become a part of every aspect of work at the Laboratory:

1. Work Planning - Clear definition of the tasks that are to be accomplished as part of any given activity.
2. Hazard and Risk Analysis - Analysis and determination of the hazards and risks associated with any activity, in particular risks to employees, the public, and the environment
3. Establishment of Controls - Controls that are sufficient to reduce the risks associated with any activity to acceptable levels. Acceptable levels are determined by responsible line management, but are always in conformance with all applicable laws and Work Smart Standards.
4. Work Performance - Conduct of the tasks to accomplish the activity in accordance with the established controls.
5. Feedback and Improvement - Implementation of a continuous improvement cycle for the activity, including incorporation of employee suggestions, Lessons Learned, and employee and community outreach, as appropriate.

These Core EH&S Functions apply at all levels of the Laboratory - at the institutional level, the division or department level, and at the level of individual projects or work activities. This plan describes how these core functions are addressed at these three levels at the Berkeley Lab, and how activities involving Laboratory contractors are managed for environment, health and safety concerns.

The Guiding Principles and the Core EH&S Functions are closely related. Each level of organization at the Laboratory will be assessed by determining (1) how each of the Core EH&S Functions are being performed at every level, and (2) how well each of the Core EH&S Functions reflects the Guiding Principles. The self-assessment criteria, which are published each year, will be written to evaluate progress and successful implementation of ISMS.

### **III. Accountability**

The Division Director is responsible and accountable for assuring that all ALS activities are carried out in a safe manner, in accordance with all Laboratory requirements. Program Heads, Group Leaders, and individual contributors are expected to identify hazards, implement controls, and increase general employee awareness of workplace ES&H issues. Division supervisory personnel are responsible and accountable to the Division Director for assuring that all activities are carried out in a safe manner, and in accordance with all of the Laboratory EH&S requirements. While this responsibility and accountability



cannot be delegated, all Division employees are responsible for conducting themselves safely at all times. Safe conduct includes adherence to all institutional ES&H policies and procedures as a condition of employment. It is the responsibility of the ALS Division supervisory personnel to ensure all participating guests, subcontractors, and visitors know and follow the safety requirements that apply to their work while at the ALS. Managers, PI's, and supervisors are responsible for the safety of contracted work by assuring qualified contractors are selected, hazards are identified, and work performed at the ALS is performed safely.

The EH&S Coordinator oversees the Division ES&H program. At the ALS, the Division EH&S Coordinator is a full-time professional matrixed from the Environment, Health, and Safety (EH&S) Division. ALS management will supply clear guidance to the ALS EH&S Coordinator as to the needs of the ALS for EH&S support. ALS management will provide constructive input to the Performance Expectations and the P2R of the ALS Division EH&S Coordinator, and will review the completed P2Rs of the ALS Division EH&S Coordinator and the support personnel for accuracy and completeness with respect to performance of their duties at the ALS. The ALS also has a matrixed radiation technician. The ES&H Administrator functions are performed by AFRD personnel matrixed part-time to ALS.

The EH&S Liaison is invited to the meetings of the ALS ES&H Committee. The EH&S Liaison provides technical support to ALS operations and coordinates requests for additional EH&S services.

The Division is divided into Groups concentrating on certain areas of operations and/or research. Each Group is headed by a Group Leader who reports to the Division Head and is responsible for ensuring that work performed by members of the group is conducted in accordance with applicable QA and ES&H programs, procedures, and requirements.

All supervisors (including Principal Investigators) are responsible for ensuring work is planned considering ES&H risks, all assigned employees are trained in ES&H responsibilities appropriate to the tasks performed, and work is performed in accordance with all applicable ES&H work authorizations and requirements.

All ALS personnel (including ALS employees, matrixed employees, temporary employees, and students) are assigned to a QUEST team, with the exception of short-term personnel. Persons whose participation in work activities at ALS are anticipated to occur over a period of less than 90 days may be included in QUEST team activities as determined by the Division Head. Each QUEST team has charge of self-assessment for the workspace of its members.

### **Matrixed Personnel**

Technical and administrative personnel from other Divisions are matrixed to AFRD, and AFRD personnel are matrixed to other Divisions. Matrixed personnel are managed in accordance with the Berkeley Lab Matrix Protocols (Figure 2). The Protocols replace the Memorandums of Understanding previously established between Divisions.

Matrix customers, Home division supervisors, and matrixed employees talk to each other about job hazards and ES&H training requirements for the work to be done in the matrix assignment.

It is the responsibility of the originating or approving engineer to ensure that design documents are processed in accordance with Engineering Division safety procedures.

The Home Division is responsible to ensure that its employees are knowledgeable, and trained, as necessary, in the basic environment, safety and health policies and procedures of the Laboratory. Matrix customer supervisors may request specific or unique training for Matrix personnel assigned to their unit, and may provide on-the-job ES&H training specific to the assignment. Home division supervisors identify and develop appropriate training plans for matrixed personnel, including ensuring the matrixed employee's ES&H Training Profile requires training appropriate to the hazards of his/her current assignment. The Job Hazard Questionnaire or ES&H Training Profile for employees who are matrixed to or from AFRD must be signed by the employee, the Matrix division supervisor, and the Home division supervisor. The Matrix division supports matrixed employee ES&H training efforts through direct and indirect funding as established on an annual basis. The Home division is responsible for ensuring that ES&H training needs are met.

The Matrix customer supervisor assigns the day to day work of the matrix employee and responds to assignment-related questions. For personnel matrixed to AFRD, AFRD is responsible for leadership in the ES&H aspects of day-to-day activities specific to the assignment. The Matrix customer refers matrixed employees to their Home division supervisor to address issues that are not directly related to the day to day tasks of the matrix assignment. The Matrix customer and Home division supervisors stay appropriately informed of and sensitive to employee issues that may be covered by collective



bargaining agreements. The Home division supervisor stays in regular communication with both the Matrix customer supervisor and the matrixed employee.

Throughout the assignment, the Matrix customer and Home division supervisor talk to each other about the employee's job performance. The Matrix customer supervisor provides timely information on performance problems to the Home division supervisor. The Home division supervisor requests the primary customer supervisor to complete the expectation section of P2R. The primary Matrix customer supervisor provides comments on performance expectations and submits them to the Home division supervisor. The Home division provides the P2R to the matrix customer for review, discussion, and comment. The employee prepares the Employee Worksheet and provides a copy to both the Matrix customer and the Home Supervisor. The Home division supervisor determines the final P2R rating. When the Home division supervisor has completed the P2R, the Matrix customer supervisor initials it, acknowledging having read the P2R. The Home division supervisor reviews the P2R with the employee. The employee addresses questions or issues related to the P2R to the Home division supervisor.

The Matrix customer and Home division supervisor discuss corrective actions for performance issues relative to the matrix assignment. Performance issues or corrective actions that may be taken relative to matters outside the scope of the matrix assignment, e.g., conduct, may be discussed with Matrix customers on a need to know basis, e.g., when action taken affects delivery of service to the customer. The Home division determines and implements any disciplinary action or counseling needed. The matrixed employee interacts with the Home division management on issues related to corrective actions.

**Figure 2. Draft Berkeley Lab Matrix Protocols 5/11/99**

|                           | <b>[C] Matrix customer</b>  | <b>[H] Home Supervisor</b>  | <b>[E] Employee</b>   |
|---------------------------|---|---|---|
| <b>Staffing</b>           | [C1] Matrix customer and Home division supervisor discuss work to be done and manpower/staffing levels, as well as movement of employees on and off assignments.  | [H1] Matrix customer and Home division supervisor discuss work to be done and manpower/staffing levels, as well as movement of employees on and off assignments.<br>[H2] Home division determines approach to meeting staffing needs, e.g., recruitment or reassignment. Matrix customers may participate in interview(s) of final candidate(s). Home division determines position description, classification and salary (ongoing).  | [E1]  |
| <b>Performance</b>        | [C2] Throughout the assignment, the Matrix customer and Home division supervisor talk to each other about the employee's job performance. The Matrix customer shall provide timely information on performance problems to the Home division supervisor. Primary matrix customer(s) must complete expectation section of P2R and submit to home supervisor. The primary matrix customer reads the P2R and signs or initials. | [H3] Throughout the assignment, the Matrix customer and Home division supervisor talk to each other about the employee's job performance. Home supervisor requests primary customer to complete the expectation section of P2R.<br>[H4] The home division provides the P2R to the matrix customer for review, discussion, and comment. Matrix customer will initial P2R acknowledging having read the P2R. The home supervisor determines the final P2R rating. Home division determines who will sit in the P2R discussions with employee. | [E2] The employee prepares the Employee Worksheet and provides a copy to both the Matrix customer and the Home Supervisor. The employee addresses questions or issues related to the P2R to the Home division supervisor. |
| <b>Corrective Actions</b> | [C3] The Matrix customer and Home division supervisor discuss corrective actions for performance issues relative to the matrix assignment. Corrective actions that may be taken relative to matters outside the scope of the matrix assignment may be discussed with Matrix customers on a need to know basis, e.g., when action taken affects delivery of service to the customer.   | [H5] The Matrix customer and Home division supervisor discuss corrective actions for performance issues relative to the matrix assignment. Performance issues or corrective actions that may be taken relative to matters outside the scope of the matrix assignment, e.g., conduct, may be discussed with Matrix customers on a need to know basis, e.g., when action taken affects delivery of service to the customer.<br>[H6] Home division determines and implements any disciplinary action or counseling needed.                     | [E3] Employee interacts with line management (Home division) on issues related to corrective actions.   |
| <b>Training</b>           | [C4] Matrix customer and Home division supervisor talk to each other about training requirements for the work to be done in the matrix assignment. Matrix customer may request specific or unique training for Matrix personnel assigned to their unit.   | [H7] Matrix customer and Home division supervisor talk to each other about training requirements for the work to be done in the matrix assignment.<br>[H8] Home division identifies/develops appropriate training plans to meet current and anticipated institutional and job specific resource requirements. Matrix divisions support these efforts through direct and indirect funding as established on an annual basis. The Home division is responsible for ensuring that EH&S training needs are met.                                 | [E4] Employee discusses performance planning and development with Home division supervisor.   |

|                   | <b>[C] Matrix customer</b>   | <b>[H] Home Supervisor</b>  | <b>[E] Employee</b>   |
|-------------------|--|---|---|
| <b>Day to Day</b> | <p><b>[C5]</b> The Matrix customer assigns the day to day work of the matrix employee and responds to assignment-related questions.</p> <p><b>[C6]</b> Matrix customer refers employee to Home division supervisor to address issues that are not directly related to the day to day tasks of the matrix assignment. The Matrix customer stays appropriately informed of and sensitive to employee issues that may be covered by collective bargaining agreements.</p> | <p><b>[H9]</b> The Home division supervisor stays in regular communication with both the Matrix customer and the employee. The Home division supervisor stays appropriately informed of and sensitive to employee issues that may be covered by collective bargaining agreements.</p> | <p><b>[E5]</b> The employee is the primary resource that delivers, collaborates, communicates and contributes a variety of services to facilitate the scientific endeavors of the Laboratory.</p> |

## **Contractors**

Division management (including Principal Investigators) takes responsibility for the safety of contracted work by assuring qualified contractors are selected, hazards are identified, and work is performed safely.

ALS contractor oversight will comply with the requirements of the ISMS. In accordance with Chapter 10 of PUB-3000, the safety rights and obligations of contract employees are the same as those of LBNL employees. AFRD supervisors assigned to direct the work of contract employees must provide instruction, safety equipment, and conditions equivalent to those provided to LBNL employees.

Construction work must be authorized by LBNL Facilities. The safety and health of construction subcontractor employees is the responsibility of the construction subcontractor.

All ALS employees, contractors, and participating guests are responsible for stopping work activities considered to be an imminent danger. An imminent danger is defined as any conditions or practices that could reasonably be expected to cause death or serious injury, or environmental harm. Stopping work involves:

- Alerting the affected employees and requesting the work be stopped.
- Calling the Berkeley lab emergency telephone number (x7911) and reporting the incident. The EH&S duty officer will be notified through this contact.
- Notify the immediate supervisor and ALS management and or EH&S coordinator.

## **IV. ES&H Committee**

The Division will maintain an ES&H/QA Committee is headed by the Division Director, chaired by his representative (the Division EH&S Coordinator), and attended by at least one representative from each group in the Division, QA Representative, and QUEST team leaders. The ALS ES&H/QA Committee will meet monthly and discusses ES&H/QA problem areas and suggests improvements to the self-assessment program. The Committee discusses ES&H and QA concerns of the programs and lessons learned from them, and information on lab-wide ES&H and QA issues. Committee participation will be recorded in minutes which are distributed electronically and located on the ALS safety web page. The minutes together with action items and dissemination of any lessons learned will be distributed to all division employees through their individual QUEST team

The Committee will maintain the Division Safety Plan, promote ES&H awareness and training, and ensure that the Division works to improve the effectiveness of the Division safety program through the safety meeting and self-assessment from the QUEST team.

This Committee will perform an annual self-assessment of all spaces within its respective jurisdiction. This assessment is described in Appendix 1.

## **V. Scope of the Work Authorized**

The Advanced Light Source (ALS) is a national facility for scientific research and development located at the Lawrence Berkeley National Laboratory of the University of California. Its purpose is to generate beams of very bright light in the far ultraviolet and soft x-ray regions of the spectrum. Within these regions, the ALS produces the world's brightest light available as an experimental tool. This national user facility, funded by the US Department of Energy, is available to qualified researchers from industry, universities, and government laboratories.

The ALS produces light in the form of bright beams of x-rays using a synchrotron storage ring. A hair-thin beam of electrons is generated by an electron gun and accelerated to 50 MeV in a linear accelerator, and then to 1.5 GeV in a booster synchrotron. The electrons are then transferred to the 200-meter storage ring. After the 10-minute filling time, the electrons remain stored for about 4 hours. As they travel around the storage ring, the electrons emit synchrotron radiation—energy in the form of photons—, which is directed by specialized optics down 12-meter long beamlines to experiment endstations.

Since the light is produced continuously while the electrons circulate in the ring, many beamlines (presently about 16) can be used simultaneously for different experiments. This bright x ray light is used for research in materials and surfaces, combustion dynamics, protein crystallography, biological microscopy, and many other fields.



Division and Program Managers, group leaders, and supervisors (including principal investigators) are responsible for considering ES&H hazards, risks, and concerns during the work planning process and appropriate controls are determined prior to authorizing work. ALS work authorization procedures are tailored to the level of hazard of the work. General duties are authorized by the employee job descriptions and by completion of training requirements determined by the supervisor. Work recognized as posing special hazards is planned and authorized as described in PUB 3000, the ISMS, Section 1.3 of the OAP, and ALS procedures. Work authorization methods commonly utilized for ALS operations are described below:

Field Task Proposal/Agreements (FTP/As), Work For Others requests (WFOs), Cooperative Research and Development Agreements (CRADAs), and Laboratory Directed Research and Development (LDRD) documents are carefully reviewed for compliance with environment, health, and safety concerns. The conceptual design process includes documented involvement of applicable EH&S Division personnel in the review of performance and regulatory requirements, codes and standards, and EH&S criteria.

Major projects (according to DOE classification criteria) undergo a formal Operational Readiness Review (ORR) or Accelerator Readiness Review (ARR) under DOE direction. Smaller projects undergo an internal readiness review and work authorization process performed by program and Division management as described below.

For experiments or facilities that require an Activity Hazard Document (AHD), the AHD is reviewed and signed by the Division Director, ALS Division EH&S Coordinator, Principal Investigator, and EH&S Division representatives.

The hazards associated with operations at LBNL are described in the Hazards, Equipment, Authorizations and Review (HEAR) database. The HEAR database is one of the tools used by the division for defining its authorized scope of work and for identifying the hazards associated with its work activities. The database information is reviewed and updated at least annually by the AFRD ES&H Administrator. Program/Project ES&H Coordinators inform the Administrator of planned changes to work scope and associated hazards.

Work requiring a Radiological Work Authorization, Sealed Source Authorization, or other EH&S permit or authorization will be performed in accordance with the authorization issued by the EH&S Division.

All modifications to the ALS personnel safety systems are authorized by the ALS Technical Safety Committee according to ALS Procedure EE 02-01. The ALS Technical Safety Committee is an ad hoc committee that also reviews and approves all changes in policies that have potential safety impact. The members of the committee are its ex-officio members, the Head of ALS Operations and the ALS Division safety coordinator, and whichever experts are technically qualified to advocate the changes and those who are qualified to approve them. The committee is convened by the ALS Division EH&S Coordinator.

New and modified beamlines at the ALS are reviewed and authorized by the Beamline Review Committee in accordance with Procedure BL 08-16.

To conduct research at the ALS, the user submits an ALS Experiment Form describing the experiment and all potentially hazardous materials and equipment to be brought to the ALS. The ALS identifies any problems or safety issues that need to be resolved before the experiment begins. The ALS uses the Experiment Form to generate an Experiment Summary Sheet (ESS) that must be completed and posted by the beamline before the experiment may begin. The ESS is used to verify that the safety and training/medical requirements are met by the equipment and users.

ALS personnel working off-site are required, at a minimum, to comply with the EH&S requirements applicable to the site at which they are working.

ALS contractor oversight will comply with the requirements of PUB-3000 and the RPM.

## **VI. Qualification and Training**

ALS selects, assigns, and retains personnel in accordance with the RPM procedures. In selecting from a group of applicants, the Division director or Division head selects the person who, based on the evaluation of the Division director or Division head, possesses the qualifications to perform the duties of the position most effectively. In making this judgment, the Division director or Division head compares the knowledge, skills, abilities, and other qualifications of the applicants with those required for successful performance of the duties of the position. ALS contractor selection will comply with the



requirements of PUB-3000 and the RPM. Effective and successful performance of duties includes performance in a manner that protects the health and safety of employees and the general public and that does not endanger the environment, as defined by the Laboratory's EH&S policies and requirements contained in the RPM, PUB-3000, ISMS, and OAP.

Each supervisor is responsible for ensuring all assigned employees whose anticipated assignment with ALS exceeds three months have completed a Job Hazards Questionnaire within the first month of employment. Whenever an employee's job assignment changes, the Job Hazards Questionnaire is reviewed to ensure that the hazards, program assignments, and safety roles entered are still valid. Annually, in conjunction with the Performance Review process, the Job Hazards Questionnaire and the employee's completion of required training is reviewed, and a training plan is developed for each employee for the next twelve-month period.

## **VII. Balanced Resources**

Principal Investigators incorporate appropriate resource allocation for ES&H concerns in all research proposals, including cost of safety equipment, permits, training, maintenance, waste disposal, and facilities modifications unless covered by institutional funding sources.

## **VIII. ES&H Resources**

To facilitate implementation and execution of the Division ES&H Program, the following resource is matrixed from AFRD:  
0.2 FTE Division ES&H Administrator

ES&H efforts are integral part of all ALS activities and are performed by all ALS personnel as needed and appropriate to the job task. The estimated level of effort is anticipated to include, but is not limited to:  
≥ 1.5 hr/employee/month QUEST activities

The following resources are made available by the EH&S Division on a matrix basis. They are available to assist ALS with any aspects relating to the implementation of this Plan.

1.00 FTE ALS Division EH&S Coordinator  
1.00 FTE ALS Radiation Technician



The matrixed individuals are accountable to the Director of the Advanced Light Source.

In addition to the matrixed personnel, ALS will require support from EH&S Division professionals on an as-needed basis. EH&S estimates that direct support activities may require a level of effort of approximately 2.5 FTE, as described in Appendix 2, Estimated EHS Support of ALS. ALS also expects to receive EH&S general programmatic support as described in PUB 3000, including, but not limited to, EH&S training courses.

## **IX. Validation, Feedback, and Improvement**

ALS' primary method of assessing and validating the effective implementation of this Plan is our self-assessment process, described in detail in Appendix 1, the QUEST Program Guide. Our self-assessment process is evaluated annually and findings are summarized in the annual ALS Self-Assessment Report. Performance measurement criteria for this report are described in Appendix 3. All walkthrough and QUEST action items not completed within 60 days are placed on the LSAD database. LSAD completion status, trends, and root causes are summarized in the ALS Self-Assessment Report.

Additional opportunities for improvement will be identified through LBNL self-assessment activities, as described in PUB-5344, ES&H Self-Assessment Program, including Integrated Functional Appraisals, Integrated Hazard Assessments, Safety Review Committee MESH reviews, and Appendix F performance reports. If any discrepancies between authorization information provided by EH&S and records maintained by AFRD are noted, these discrepancies will be discussed with the appropriate EH&S personnel and the relevant documents will be corrected or clarified as necessary. DOE, UC, and ES&H regulatory agency oversight activities may identify necessary improvements. Applicable information from the LBNL Lessons Learned program will be disseminated by the ES&H Administrator as another means to share information for accident prevention and hazard awareness.

This Plan will be reviewed and updated annually, and may be revised more frequently as needed to facilitate compliance with regulatory and contract requirements and enhance the effectiveness of the Plan.



**Advanced Light Source  
Environment, Safety, and Health Management Plan**

**Review and Approval**

**Signatures:**

*Submitted by:*

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Daniel Chemla, Director  
Advanced Light Source

*EH&S Resource Commitment:*

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David C. McGraw, Director  
Environment, Safety, and Health Division

*Accepted:*

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Charles V. Shank, Director  
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## APPENDIX 1

### INTRODUCTION

**QUEST** is an integrated way to examine **Q**uality Assurance/Improvement and **E**nvironment, Safety, and Health through **S**elf-Assessment and **T**eamwork. Its basic premise is that teams composed of employees actually performing the work of the Programs are in the best position to evaluate the quality and safety of their workplace.

### HISTORY

- **QUEST** was developed in 1994
- It was revised as **QUEST-II** in 1996.
- The April 1998 update aligned the **QUEST** program with the Lab Integrated Safety Management System by incorporating **QUEST** into the ALS ES&H Management Plan.
- The October 1998 update provided greater flexibility to teams in deciding how to implement **QUEST**.
- The January 2000 update established an annual **QUEST** review as the required minimum level of **QUEST** participation and revised the Quality Assurance aspects of self-assessment.
- The April 2001 update simplifies the **QUEST** Fundamentals checklist and revises the Quality Assurance section.
- ALS management will review the **QUEST** program annually as part of our Integrated Safety Management Plan update.

### OBJECTIVES

The main objective of **QUEST** is the identification and mitigation of any condition or process that jeopardizes the safety and health of employees, protection of the environment, or the quality of ALS research or operations. The **QUEST** process involves all long-term ALS personnel to raise awareness of ES&H and quality issues and develop the habit of identifying, reporting, and resolving potential problems before accidents or occurrences result. **QUEST** teams are also encouraged to identify opportunities for improvement, examine each of these opportunities, and implement those actions that they believe will lead to the improvement desired.

## **PROCESS**

### **Required Activities:**

All ALS personnel (including Division employees, matrixed employees, visitors, temporary employees, students, and participating guests) are assigned to a QUEST self-assessment team. The exceptions are short-term personnel (persons whose participation in ALS work activities at LBNL are anticipated to occur over a period of less than 90 days/year) and the electricians assigned to the ALS who participate in safety meetings and other functions with their home division.. Persons whose participation in work activities at ALS are anticipated to occur over a period of less than 90 days may be included in a QUEST team as determined by the Program Head. Composition of the teams is left to the discretion of the appropriate Program Head or Project Leader, but each team should have charge of self-assessment for the workspace of its members.

QUEST safety team leaders must coordinate team assignments to ensure the annual inspections cover all the Program/Project space at LBNL. Teams may work together or exchange areas.

Each QUEST team is required to perform an assessment of workplace ES&H hazards at least once each year. The Team Leader may select a subset of team members to perform the actual workplace inspection and report the findings to the team.

The applicable items on the QUEST Fundamentals checklist must be checked. (NOTE: ALS may designate different checklists for ALS assessments.) The additional checklists from Section 4 of this Guide are provided as tools teams may use when conducting inspections. Team members are also encouraged to identify quality assurance issues. The annual inspection must be completed before the end of the designated QUEST inspection month. The inspection may take place before the designated QUEST month to accommodate the work schedules of team members.

Each team must meet at least once each year to discuss the workplace inspection findings and solicit additional reports of concerns from its members. Teams must report any unresolved concerns to the ALS ES&H Coordinator. The ALS ES&H/QA Administrator will enter ES&H action items past 60 days into the Laboratory's Self-Assessment Database (LSAD) and track them to completion. QA action items will be forwarded to the ALS QA Operations Committee.

Program Heads and Group Leaders may establish additional requirements for QUEST activities within their Program.

### **Recommended Activities:**

In addition to the required annual inspection, QUEST teams are encouraged to remain active throughout the year. QUEST teams can play an important role in assisting personnel in identifying and solving problems. Team meetings are one way of providing feedback to the team on the actions that have been taken as a result of the concerns team members have identified.



QUEST team meetings are also an opportunity to pass along relevant information from the ALS ES&H and QA committees. QUEST teams meet monthly. Appropriate meeting topics include any issue affecting safety, the environment, or quality assurance. Teams are encouraged to choose topics that are "local issues" and fit their needs.

Teams may choose to perform additional assessments of particular areas or aspects of their work. If deficiencies are uncovered, corrections should be made immediately when practical. Section 4 of this guide includes an example of a form for recording all deficiencies found and corrections made. Items requiring the assistance of other LBNL organizations to correct, or for which additional guidance is needed should be promptly referred to the ALS ES&H Coordinator.

## **TEAM STRUCTURE**

Teams may comprise those with similar job descriptions, those who work in a given area, those who work together on specific projects, or any other selection criteria deemed appropriate by the Program.

Each QUEST team must have a team leader. The team leader may be appointed by Program management or elected by the team members.

Every team member is encouraged to attend all scheduled QUEST meetings. Each team member should have an active role to play in some facet of QUEST activities each year, e.g., writing a quality assurance policy or procedure, recording team activities, participating in self-assessment inspections, etc.

## **RECORDS**

Each QUEST team will maintain a record of its activities including minutes and attendance rosters for all meetings, copies of inspection/correction lists, and a final report of actions taken or planned. The team leader will provide copies of these documents to the ALS ES&H Coordinator. As an agenda item on each ALS ES&H Operations Committee meeting, items considered by the Division to be significant will be discussed. Quality assurance issues will be forwarded to the ALS QA Officer.

## **QUEST ROLE IN DIVISION SELF-ASSESSMENT**

The Laboratory has implemented a self-assessment system that ALS fully supports and in which the Division actively participates. This system includes the following assessments:

- Management Environment, Safety, and Health (MESH) assessments, conducted every three years by the senior research personnel on the Safety Review Committee, review how well the management systems described in our AFRD ES&H Management Plan are functioning.
- Integrated Functional Appraisals (IFA), performed every three years by teams of EH&S Division specialists who make comprehensive inspections of AFRD operations based on identified risk levels.
- Division Self-Assessments, performed annually by each Division, measure the implementation of the Division ES&H Management Plans.

**QUEST** is an important part of this system. Instead of waiting for an EH&S or Safety Review Committee self-assessment team to inspect our areas before we take action, we constantly assess the quality and safety of the locations where we work. After all, who is more familiar with our work and the hazards we face than we are? Assessment of Division spaces for day-to-day deficiencies (in both the ES&H and QA areas), and correction of these deficiencies, is accomplished by **QUEST** teams. Identifying and resolving easily correctable deficiencies within the Division permits Integrated Functional Appraisal teams to direct more of their attention to helping us improve our performance in less obvious areas. To avoid duplicated effort, the IFA teams review our **QUEST** action items as part of their appraisal and then focus their inspections on the more difficult to identify deficiencies.

The annual Division Self-Assessment report is compiled (by the AFRD ES&H Administrator) by reviewing **QUEST** documentation, findings from safety walkthroughs by Division and Program management, and other performance information such as accident reports, regulatory agency inspection reports, and findings of EH&S Division and Safety



Review Committee assessments. Your **QUEST** findings help us identify ways of improving our ES&H/QA efforts. Our Division ES&H Self-Assessment Report is submitted to the Division Director and the Office of Assessment and Assurance. Findings and performance ratings of all the Division Self-Assessments are rolled up in an LBNL ES&H self-assessment report. The results are summarized for LBNL management in an ISM-Based Division Performance at a Glance Table.

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### LBNL FY 2001 ISM-Based Division Performance at a Glance

| Expectation  | Data/Result   | Rating   |
|--|---|--|
| evidence of strong ES&H communication  | documented communication  | satisfactory – green<br>partial – yellow<br>marginal - red   |
| evidence of ES&H accountability for employees and participating guests   | documented in P2R or alternative  | satisfactory – green<br>partial – yellow<br>marginal - red   |
| ISM plan is reviewed and updated annually  | yes/no  | yes – green<br>no - red  |
| evidence resources and funds allocated to address ES&H issues  | yes/no  | satisfactory – green<br>partial – yellow<br>marginal - red   |
| % work with hazard reviews and % authorized work being reviewed within required schedule                           | documented reviews of authorized and medium and low hazard work   | >85% -green<br>>60% <85% - yellow<br><60% - red  |
| chemical inventory updated within past 12 months   | yes/no  | >85% done on schedule – green<br><85% reviewed, but timely support has been sought – yellow<br><85% of reviews performed - red |
| % engineering controls (i.e., fume hoods, biocabinets, gloveboxes) certified/tested, including monitor calibration | units certified, tested or calibrated / total biocabinets, gloveboxes, fume hoods, monitors                     | >85% done on schedule – green<br><85% reviewed, but timely support has been sought – yellow<br><85% of reviews performed - red |
| emergency contact information up to date and reviewed annually   | yes/no  | >85% - green<br>>60%, <85% - yellow<br><60% - red  |
| evidence of an effective ergonomics program  | Division has an active ergonomic prevention program relative to degree of ergonomic hazards present in division | satisfactory – green<br>partial – yellow<br>marginal - red   |
| % authorized work w/o major deficiencies   | RWAs, AHDs, etc, without major deficiencies / total RWAs, AHDs, or other authorized work                        | <i>regulatory driven</i><br>>90% green<br>>75% <90% yellow<br><75% red   |
| % SAAs in compliance   | SAAs without deficiencies / total SAAs  | <i>regulatory driven</i><br>>90% green<br>>75%, <90% yellow<br><75% red  |
| % QA compliance rate   | % waste samples analyzed that pass  | <i>regulatory driven</i><br>>95% or only 1 failure – green<br>>92% ,<95% - yellow<br><92% - red                                |

| Expectation  | Data/Result   | Rating   |
|--|---|--|
| # NCARs  | number of NCARs   | <i>regulatory driven</i><br>0 – green<br>type 1 - yellow<br>any type 2 - red   |
| Injuries and accidents data  | number of DOE reportables   | <i>contract driven</i><br>TRC >25% below 3.0 or 20% improvement or 1 case/yr. – green<br>TRC <25% below/above 3.0 or 10% improvement or 2 cases/yr. – yellow<br>>25% above 3.0 - red |
| % completion of JHQ or equivalent system   | Rates from training database  | >85% green<br>>60%, <85% yellow<br><60% red  |
| % completion rate of required courses  | rates from training database  | >85% green<br>>60% <85% yellow<br><60% red   |
| % completion or emergency response training  | rates from training database  | >85% green<br>>60% <85% yellow<br><60% red   |
| % wastes reduction   | Division meets division-specific waste minimization goals, as agreed to with Waste Management Group | satisfactory – green<br>partial – yellow<br>marginal - red   |
| % work space inspected   | inspection of space / total space   | >85% green<br>>60% <85% yellow<br><60% red   |
| evidence of management walkthroughs, including division director, department heads, group leads; SAARs completed | yes/no  | satisfactory – green<br>partial – yellow<br>marginal - red   |
| LSAD completion rate   | completed LSADs / total LSADs   | <i>contract driven</i><br>>90% green<br>>75% <90% yellow<br><75% red   |
| evidence of active safety management group or safety committee   | meeting minutes, issue resolutions  | Meet per division ISM plan and issues resolved – green<br>sporadic meetings and unresolved issues – yellow<br>committee not active - red   |

## SECTION 2.

### 2001 QUEST TEAM ROSTER

#### TEAM 1:

INSPECTIONS: Bldgs. 2, 4, 6, 7, 10, 80, 80A offices & 7 warehouse

- **Ben Feinberg**, Wendell Agot, Daniel Chemla, Jim Krupnick, Ed Lampo, Georgeanna Perdue, Neville Smith
- **Ruth Pepe**, Meredith Castro, Jeremy Coyne, Bernadette Dixon, Parish Epps, Sharon Fujimura, Annette Greiner, Liz Moxon, Barbara Phillips, Steve Rossi, Mireille Sattar, Lori Tamura, Greg Vierra, Judy Zelter
- **Donna Hamamoto**, Todd Anderson, Gary Giangrasso, Cheryl Hauck, Gary Krebs, Alex Lobodovsky, Tony Marquez, Art Robinson

#### TEAM 2:

INSPECTIONS: Bldgs. 10 & 80 (shops)

- **Alan Biocca**, William Brown Jr, Ed Domning, Ken Fowler, Craig Ikami, Suzanna Jacobson, Jim McDonald, Alan Robb, Loren Shalz, John Spring, Rick Steele, Chris Timossi, Jerry Tunis
- **Dan Colomb**, Robert Armstrong, William Baldock, Dennis Calais, Donald Davis, Michael Decool, Richard DeMarco, Dennis Gibson, Dennis Hull, Donna Jones, Steven Klingler, Charles Knopf, Donald MacGill, Harry Meyer, Vladimir Moroz, Greg Morrison, Wayne Oglesby, John Pepper, Ken Sihler, Harold Stewart, Monroe Thomas, Ed Wong, Frank Zucca
- **Jim Gregor**, Ronald Cole, Ronny Colston, Mike Foster, Tho Nhan, James Nomura, Sergio Rogoff, Ronald Slater
- **Bruce Samuelson**, Doug Bentsen, Jim Bishop, David Brothers, Eduardo Diaz, Orland Jones, Jan Pusina, Tom Scarvie, Scott Stricklin, Michael Wolfe

#### TEAM 3:

INSPECTIONS: Bldgs. 2, 6, 10, 80 (labs)

- **Art Ritchie**, Barry Bailey, Moises Balagot, Karl Bolin, Jonathan Elkins, Rita Jones, Al Lindner, Paul Molinari, Fred Ottens, Harry Scheid, Ken Woolfe, Bob Mueller,
- **Tony Young**, Glen Ackerman, Elke Arenholz, John Bozek, Richard Celestre, Jonathan Denlinger, Sirene Fakra, Jun Feng, Byron Freelon, Ernie Glover, Nasser Hamdan, Everett Harvey, Phil Heimann, Malcolm Howells, Zahid Hussain, Steve Irick, Aaron Lindenberg, Scott Locklin, Alastair MacDowell, Matthew Marcus, Michael Martin, Wayne McKinney, Howard Padmore, Jamshed Patel, Eli Rotenberg, Bruce Rude, Fred Schlachter, Andreas Scholl, Wayne Stolte, Robert Sublett, Nobumichi Tamura, Tony Warwick
- **Hiroshi Nishimura**, John Byrd, Terry Byrne, David Robin, Chris Steier, Ying Wu
- **Mike Bell**, Robert Gassaway, Ron Gervasoni, J Helmers, Larry Jordan

#### TEAM 4:

INSPECTIONS: Bldg. 46 & 27

- **Mike Kritscher**, Jason Akre, Nord Andresen, Dennis Baum, Lionel Bonifas, Daniela Cambie, Mark Coleman, Jim Comins, Carol Corradi, Curtis Cummings, Rob Duarte, Keith Franck, Alex Gavidia, Jin Young Jung, Nicholas Kelez, Andrea Lim, Steve Marks, Pat McKean, Vinh L. Ngo, Rob Patton, Paul Pipersky, Dave Plate, Ken Rex, Ross Schleuter, Niles Searls, Troy Stevens, Will Thur, Jon Zbasnik
- **Walter Barry**, Ken Baptiste, Bob Benjegerdes, Randy Candelario, Michael Chin, Michael Fahmie, Allen Geyer, Jim Julian, Slawomir Kwiatkowski, Greg Stover, Brian Taylor

### SECTION 3. ES&H/QA CONCERNS

One of the primary purposes of **QUEST** is to ensure that any concern you have about your safety or health, the health or safety of your co-workers, protection of the environment, or quality assurance in your work area is brought to the attention of management.

The forms that follows (or equivalent forms) are used by **QUEST** team members to submit concerns to their Team Leader.

The first form, the ES&H Concerns Report, is designed for use during **QUEST** inspections or by team members to report concerns noticed in the work place at any time.

The second form, the **QUEST** Meeting Report is designed for recording team meetings.

Some teams have found it useful to post a list in an easy-to-find location, such as a bulletin board in the work area, and encourage team members to add concerns they notice in the course of their daily work. The third form, the **QUEST** Action Item List, may be used for this purpose. This technique is particularly useful for teams whose schedules make it difficult to get everyone together for regular meetings.

Prompt resolution of these issues will improve our safety, efficiency, and compliance with requirements. If a concern cannot be addressed without assistance from others, the Team Leader should immediately forward the concern to the ALS ES&H Coordinator or Quality Assurance Representative. These action items will be forwarded to the AFRD ES&H/QA Administrator who will track them on ALS' action item spreadsheet. Only ES&H items that have not been resolved within 60 days will be entered into LSAD, the Laboratory's Self-Assessment Database, for tracking.

**We want to hear from you!**



**ALS QUEST CIRCLE**  
**Findings from Inspection**

Team # \_\_\_\_\_  
Inspection Date \_\_\_\_\_  
Areas Inspected \_\_\_\_\_  
Inspector(s) \_\_\_\_\_

**Finding:**

Location: Bldg: \_\_\_\_\_ Room or Beamline: \_\_\_\_\_ other: \_\_\_\_\_

Description:

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Status:

- ☐ Resolved (date) \_\_\_\_\_  
☐ Will be resolved by this team, or  
☐ Referred to ES&H Coordinator (Georgeanna Perdue), or  
☐ Referred to QA Officer (Ed Lampo), or  
☐ Referred to \_\_\_\_\_

**Finding:**

Location: Bldg: \_\_\_\_\_ Room or Beamline: \_\_\_\_\_ other: \_\_\_\_\_

Description:

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Status:

- ☐ Resolved (date) \_\_\_\_\_  
☐ Will be resolved by this team, or  
☐ Referred to ES&H Coordinator (Georgeanna Perdue), or  
☐ Referred to QA Officer (Ed Lampo), or  
☐ Referred to \_\_\_\_\_

**QUEST Meeting Report**

*Please submit copy of completed forms to Program/Project ES&H Coordinator*

AFRD

Quality ES&H Self-Assessment  
Teamwork

Team Leader \_\_\_\_\_

Program/Project: \_\_\_\_\_

Date: \_\_\_\_\_

**QUEST Meeting** *Please submit copy of completed forms to Pat Thomas, MS 50-4037*

Advanced Light Source

Discussion

Leader \_\_\_\_\_

**Quality ES&H Self-Assessment  
Teamwork**

Group: \_\_\_\_\_  
Meeting  
Date: \_\_\_\_\_

**QA/ES&H Topic(s) of Discussion:**

**Items of ES&H/QA Concern:**

|   |
|---|
| <p>1. _____</p> <p>Resolved Immediately <input type="checkbox"/> <b>or</b></p> <p>Will be Resolved by this team <input type="checkbox"/> <b>or</b></p> <p>Referred to ES&amp;H Coordinator (Georgeanna Perdue) <input type="checkbox"/> <b>or</b></p> <p>Referred to QA Officer (Ed Lampo) <input type="checkbox"/> <b>or</b></p> <p><input type="checkbox"/> Referred to: _____ <b>or</b></p> <p><input type="checkbox"/> Resolved (Date) _____ <b>or</b> (If more than two months from identifying concern)</p> <p><input type="checkbox"/> Referred to Pat Thomas for inclusion into LSAD (Date) _____</p> |
| <p>2. _____</p> <p>Resolved Immediately <input type="checkbox"/> <b>or</b></p> <p>Will be Resolved by this team <input type="checkbox"/> <b>or</b></p> <p>Referred to ES&amp;H Coordinator (Georgeanna Perdue) <input type="checkbox"/> <b>or</b></p> <p>Referred to QA Officer (Ed Lampo) <input type="checkbox"/> <b>or</b></p> <p><input type="checkbox"/> Referred to: _____ <b>or</b></p> <p><input type="checkbox"/> Resolved (Date) _____ <b>or</b> (If more than two months from identifying concern)</p> <p><input type="checkbox"/> Referred to Pat Thomas for inclusion into LSAD (Date) _____</p> |
| <p>3. _____</p> <p>Resolved Immediately <input type="checkbox"/> <b>or</b></p> <p>Will be Resolved by this team <input type="checkbox"/> <b>or</b></p> <p>Referred to ES&amp;H Coordinator (Georgeanna Perdue) <input type="checkbox"/> <b>or</b></p> <p>Referred to QA Officer (Ed Lampo) <input type="checkbox"/> <b>or</b></p> <p><input type="checkbox"/> Referred to: _____ <b>or</b></p> <p><input type="checkbox"/> Resolved (Date) _____ <b>or</b> (If more than two months from identifying concern)</p> <p><input type="checkbox"/> Referred to Pat Thomas for inclusion into LSAD (Date) _____</p> |

**Attendance (please print)**

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|  |  |
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## SECTION 4. ES&H CHECKLISTS

### USING THE CHECKLISTS

**The applicable items listed on the QUEST Fundamentals Checklist must be reviewed for all work areas at least once a year.** This checklist covers items we have promised Lab Management we will check as part of our ALS' Integrated Safety Management Plan.

Additional checklists are provided as optional tools. **QUEST** teams may use these checklists to help them identify safety concerns. These checklists are particularly useful to team members who are doing **QUEST** inspections for the first time.

The ES&H/QA Concerns Report form included in Section 3 of this Guide can be used to record any concerns involving checklist items.

## **Team 1**

### **Buildings 2, 4, 6, 7, 10, 80, 80A**

### **Offices & Warehouse in 7**

#### **Asbestos Exposure**

Are cement materials that contain asbestos (e.g., transite panels) in good condition?

Is asbestos-containing thermal insulation on plumbing equipment, steam pipes, etc. in good condition (i.e., all exposed surfaces, including ends, are sealed)? **NOTE: Report punctures and deteriorating insulation to the Industrial Hygiene Group**

Are floor tiles in good condition, and not being abraded or scraped as a result of work practices (floor buffing, scraping chairs, machinery vibration, etc.)?

#### **Business Services**

Are retirees and students assigned shared office space?

Is all sensitive (attractive) and capital property accurately accounted for?

#### **Electrical**

Are 3-wire cord plugs undamaged (no tape), with no removed grounding pins?

Are all electrical raceways and enclosures securely fastened in place?

Are all unused openings (including conduit knockouts) in electrical enclosures and fittings closed with appropriate covers, plugs or plates?

Are clamps (strain reliefs) or other securing means provided on flexible cords or cables at plugs, receptacles, tools, equipment, etc., and is the cord jacket securely held in place?

Are cords and cables free of grease, oil, or chemicals; unfrayed; and free of splices or taps?

Are daisy chains of extension cords and power strips avoided?

Are electrical cords and wires protected from damage?

Are electrical enclosures such as switches, receptacles, junction boxes, etc., provided with tight-fitting covers or plates of approved materials and design?

Are electrical outlets of approved three-wire (grounding) type?

Are electrical panels and breakers properly labeled? Are all disconnecting switches and circuit breakers labeled to indicate their use or equipment served?

Are extension cords:

- 1) equipped with proper cord plugs,
- 2) positioned so they do not create trip hazards,
- 3) not used in place of permanent wiring, and
- 4) equipped with grounding conductors?

Are ground fault interrupters (GFCI's) for 120-volt 15- and 20-amp receptacles installed in wet or damp areas and in receptacles within 6 feet of sinks and fume hood sinks?

Are items of electrical equipment, cords, and connectors maintained in good condition, free from damaged insulation, loose connections, exposed terminals, or loose wires?

Are multiple plug adapters prohibited?

Are oil filled transformers provided with secondary containment in the event of an oil leak?

- Are power strips LBNL approved and labeled with the U.L. symbol?
- Are receptacles and outlets in good condition (not loose or broken)?
- Are space heaters provided with tip-over switch?
- Are there no more than 13 convenience outlets on a 20-amp circuit?
- Are warning signs posted where employees, other than qualified employees, might come in contact with live parts?
- If emergency lighting units are connected by cord and plug, are cords no more than three feet long?
- Is permanently located machinery hard wired, unless specifically intended for flexible cord connection per LBNL criteria?
- Is sufficient access and working space provided and maintained about all electrical equipment to permit ready and safe operations and maintenance? Is there a 30 inch wide and 3 foot deep clearance maintained around control switches, circuit breakers, and electrical panels?
- Is the practice of stringing cords or wiring on pipes, conduit, nails, or hooks or across ceilings avoided? Is the practice of running flexible cords and cables through holes in walls, ceilings, or floors avoided?
- Is there no more than 13 feet of plug strip on a 20-amp circuit?

#### **Elevated Surfaces**

- Are all elevated surfaces (beneath which people or machinery could be exposed to falling objects) provided with standard 4-inch toe boards?
- Are signs posted, when appropriate, showing the elevated surface load capacity? Are loads on elevated surfaces within posted load capacity?
- Is a permanent means of access and egress provided to elevated storage and work surfaces?
- Is material on elevated surfaces piled, stacked or racked in a manner to prevent it from tipping, falling, collapsing, rolling or spreading?

#### **Employer Posting**

- Are building and trailer identification numbers posted on exterior? Are room numbers readily visible?
- Are hazard warning signs and tags used where there are immediate dangers or potential hazards? Are caution and information signs used where there are potential hazards or need for general instructions? Are obsolete signs promptly removed?
- Are signs concerning exiting from buildings, room capacities, floor loading, or exposures to x-ray, microwave, or other harmful radiation or substances posted where appropriate?
- Are emergency telephone numbers posted where they can be readily found in case of emergency?
- Do occupants know the location of the assembly area(s) and evacuation route(s)?

#### **Energy Conservation**

- Are there loose windows, non-closing doors, holes in outside walls, and other building deficiencies which result in excess use of energy?
- Is inefficient use of energy caused by heating large areas when spot heating would be sufficient, lighting unoccupied areas, etc., avoided?
- Where space heating is inadequate, have all work areas (fixed and occupied) been provided with spot heating?

## **Fire Protection**

Are amounts of flammable and combustible liquids greater than 10 gallons stored in an approved flammable liquid cabinet, storage room, or storage area?

Are Class 1A flammable liquids stored in metal containers with a maximum capacity of 1 gallon or in safety containers with a maximum capacity of two gallons? Are other flammable and combustible liquids stored in containers (metal or safety cans) with a maximum capacity of five gallons?

Are combustible scrap, debris, and waste materials (oily rags, etc.) stored in covered metal receptacles and removed from the worksite properly?

Are exit doors and gates maintained to open without a key, tool, or special effort?

Are exit doorways, corridors, stairs, walkways, and aisles kept free of obstructions and combustible materials?

Are fire extinguishers visible and readily accessible? Are extinguishers inspected monthly and have maintenance inspections been performed within the last 12 months (as noted on the inspection tags)?

Are fire sprinkler heads and pipes kept free of decorations, wire, and other materials?

Are heat-producing appliances located at least 18 inches from combustible material?

Are materials stored in a secure and orderly manner?

Are mechanical, equipment, boiler rooms, attics, and unfinished spaces kept free of combustible materials?

Are three foot clearances from extinguishers, hose racks, and system valves maintained?

Are three foot clearances from hydrant or sprinkler connections maintained?

Are work aisles maintained at a minimum 24 inch width and other aisles at a minimum 36 inch width?

Do exit signs contain the word "EXIT" in lettering at least 6 inches high, with the stroke of the lettering at least 3/4 inch wide? Are the signs and exits adequately illuminated?

Is proper clearance of 18 inches maintained below sprinkler heads and two feet below ceilings?

## **Floor and Wall Openings**

Are all floor holes into which persons can accidentally walk guarded either by a standard railing with a standard toe board on all exposed sides or by a floor hole cover that is hinged in place?

Are floor and stairway openings guarded by a cover, a guardrail, or equivalent on all sides (except at entrance to stairways or ladders)?

Are toe boards installed around the edges of permanent floor openings where persons may pass below the opening?

Is every open-sided floor or platform 4 feet or more above the adjacent floor or ground level guarded by a standard railing on all open sides except where there is an entrance to a ramp, stairway, or fixed ladder?

## **Identification of Piping Systems**

Are pipelines carrying hazardous substances identified by tags? Are the tags constructed of durable materials? Is the message carried clearly and permanently distinguishable? Are tags installed at each valve or outlet?

## **Ladders**

Are only approved ladders or step stools in use?

Are portable metal ladders legibly marked with signs reading "CAUTION - Do Not Use Around Electrical Equipment" or equivalent wording?

**Lead Exposure**

If painted lead objects (excluding material used for shielding) are present in the work place, has the Industrial Hygiene Unit evaluated the airborne lead levels?

**Lifting/Loading**

Are tote box loads less than 50 lbs.? Are heavily loaded tote boxes labeled to indicate excess weight?

**Machine Guarding and Safety**

Are fan blades protected with a guard having openings no larger than 1/2 inch, when operating within 7 feet of the floor or working level?

**Maintenance Management**

Is preventive maintenance performed efficiently and within prescribed time limits?

**Material Handling**

Are Material Safety Data Sheets available to employees who handle or may be exposed to hazardous substances?

Are materials stored above 6 feet in height secured or contained so that individual articles cannot fall?

Are storage racks internally braced and secured to prevent tipping?

Do employees always wear gloves and safety glasses or protective goggles while handling metal banding?

**Occupational Noise**

Has the Industrial Hygiene Unit been contacted to arrange for noise monitoring if background noise makes it impossible to conduct a normal conversation without shouting?

**Seismic and General Work Environment**

Are adequate labels present to prevent food or beverages from being stored in laboratory and shop refrigerators or cabinets used for chemical storage?

Are all worksites, restrooms, and washrooms clean and orderly and in a sanitary condition?

Are bookcases, lockers, file cabinets, furniture, and equipment over three feet high secured against falling during an earthquake? Do storage cabinets and file cabinets have securely closing doors or drawers?

Are ceiling panels, overhead light fixtures, and other overhead objects properly secured? Are wall bulletin boards, chalk boards, framed pictures, and window blinds properly secured?

In areas where means of egress could be blocked, are books and other heavy objects prevented from falling off high shelves (lips on bookcase shelves or bungee cords)?

Is storage of heavy items on shelves, tops of bookcases, or tops of file cabinets above 3 feet avoided?

Is a finger guard installed on table top paper cutter?

**Stairs and Stairways**

Are standard stair rails or handrails on all stairways having four or more risers?

Are steps on stairs and stairways designed or provided with a surface that renders them slip resistant?

Where stairs or stairways exit directly into any area where vehicles may be operated, are adequate barriers and warnings provided to prevent employees stepping into the path of traffic?

**Walkways**

Are aisles and passageways kept clear and free of tripping hazards?

Are wet surfaces covered with non-slip materials?

### **Waste Discharges**

Are drains labeled with signs indicating that hazardous materials should not be poured down the drain?

### **Workstation Ergonomics**

Are the worker's feet flat on the floor or supported by a footrest?

Are workstations adjustable and arranged to minimize excessive twisting, bending, reaching and pulling?

Do workers take rest breaks at regular intervals as appropriate to the intensity of the tasks?

Does the location of the keyboard allow the worker's forearms to be parallel to the floor (i.e., at right angles to the spine), and the wrists straight, in line with the forearm?

Have position adjustments wrist rest and/or mouse pad rest been considered if the worker's wrists are resting on a hard or sharp surface?

Is adequate space available for workstation hardware (e.g., VDT monitor, keyboard, mouse/trackball, document holder, wrist rest)?

Is adequate space available under the work surface/table so that the legs, knees and thighs do not rub or hit the work surface, or items stored underneath?

Is the chair adjustable and does it provide proper lower back support?

Is the VDT monitor positioned to avoid glare (e.g. from overhead lights or window light)?

To minimize neck and shoulder strain, is the top of the VDT display screen at or slightly below the worker's eye level; and is the VDT monitor located directly in front of and 18-24 inches from the worker?

## **Team 2 Buildings 80 & 10 Shops**

### **Abrasive Wheel Equipment - Grinders**

Are machines designed for a fixed location securely anchored to prevent movement, or designed in such a manner that in normal operation they will not move?

Do abrasive wheel safety guards cover the spindle end, nut, and flange projections?

Is an adjustable work rest of rigid construction used to support the work of offhand grinding machines? Is the work rest kept adjusted closely to the wheel with a maximum clearance of 1/8 inch?

Is the adjustable tongue or end of the peripheral member at the top of the housing used and kept adjusted to within 1/4" of the wheel.

### **Air Permits**

If an operation, process, or equipment emits either nonradiological substances (toxic or organic) or radionuclides into the air, or if any of the following has changed in the past year or is expected to change in coming year:

- 1) source location,
  - 2) total hours of operation,
  - 3) type of material processed,
  - 4) quantity of material processed annually,
  - 5) addition of an air emissions abatement device,
- has EH&S been notified to determine regulatory compliance requirements?

### **Asbestos Exposure**

Are cement materials that contain asbestos (e.g., transite panels) in good condition?

Is asbestos-containing thermal insulation on plumbing equipment, steam pipes, etc. in good condition (i.e., all exposed surfaces, including ends, are sealed)? **NOTE: Report punctures and deteriorating insulation to the Industrial Hygiene Group**

### **Chemical Labeling and Storage**

Are all chemical containers labeled as to their contents and hazard?

Are chemicals stored in approved containers with, if necessary, secondary containment? Are containers with flammable or toxic chemicals tightly closed and covered when not in use?

### **Chemical Spill Response**

Are hazardous liquids such as solvents stored and dispensed where they cannot accidentally spill into drains(floor or sink)?

Are spill kits readily accessible?

### **Compressed Gas Cylinders - Storage and Handling**

Are cylinders legibly marked to clearly identify the type of gas contained?

Are fuel-gas cylinders placed with valve end up whenever in use; and liquefied gases stored with the valve end up?

Do compressed gas cylinders have appropriate pressure relief devices?

## **Compressors and Compressed Air**

Are employees prohibited from using compressed air at greater than 30 psi for cleaning purposes?

Are safety glasses required in areas where air guns or nozzles are used?

When using compressed air for cleaning, do employees wear personal protective equipment and ensure that chip guarding is in place?

## **Electrical**

Is restart protection provided in the control device of motors driving machines or equipment which could cause probable injury from inadvertent starting after a power loss?

Are 3-wire cord plugs undamaged (no tape), with no removed grounding pins?

Are all electrical raceways and enclosures securely fastened in place?

Are all unused openings (including conduit knockouts) in electrical enclosures and fittings closed with appropriate covers, plugs, or plates?

Are clamps (strain reliefs) or other securing means provided on flexible cords or cables at plugs, receptacles, tools, equipment, etc., and is the cord jacket securely held in place?

Are cords and cables free of grease, oil, or chemicals unfrayed and free of splices or taps?

Are daisy chains of extension cords and power strips avoided?

Are electrical cords and wires protected from damage?

Are electrical enclosures such as switches, receptacles, junction boxes, etc., provided with tight-fitting covers or plates of approved materials and design?

Are electrical outlets of approved three-wire (grounding) type?

Are electrical panels and breakers properly labeled? Are all disconnecting switches and circuit breakers labeled to indicate their use or equipment served?

Are extension cords:

- 1) equipped with proper cord plugs,
- 2) positioned so they do not create trip hazards,
- 3) not used in place of permanent wiring, and
- 4) equipped with grounding conductors?

Are ground fault interrupters (GFCI's) for 120-volt 15- and 20-amp receptacles installed in wet or damp areas and in receptacles within 6 feet of sinks and fume hood sinks?

Are items of electrical equipment, cords, and connectors maintained in good condition, free from damaged insulation, loose connections, exposed terminals, or loose wires?

Are multiple plug adapters prohibited?

Are oil filled transformers provided with secondary containment in the event of an oil leak?

Are power strips LBNL approved and labeled with the U.L. symbol?

Are receptacles and outlets in good condition (not loose or broken)?

Are space heaters provided with tip-over switch?

Are there no more than 13 convenience outlets on a 20-amp circuit?

Are warning signs posted where employees, other than qualified employees, might come in contact with live parts?

If emergency lighting units are connected by cord and plug, are cords no more than three feet long?

Is permanently located machinery hard wired, unless specifically intended for flexible cord connection per LBNL criteria?

Is sufficient access and working space provided and maintained about all electrical equipment to permit ready and safe operations and maintenance? Is there a 30 inch wide and 3 foot deep clearance maintained around control switches, circuit breakers, and electrical panels?

Is the practice of stringing cords or wiring on pipes, conduit, nails, or hooks or across ceilings avoided? Is the practice of running flexible cords and cables through holes in walls, ceilings, or floors avoided?

Is there no more than 13 feet of plug strip on a 20-amp circuit?

### **Elevated Surfaces**

Are all elevated surfaces (beneath which people or machinery could be exposed to falling objects) provided with standard 4-inch toe boards?

Are signs posted, when appropriate, showing the elevated surface load capacity? Are loads on elevated surfaces within posted load capacity?

Is a permanent means of access and egress provided to elevated storage and work surfaces?

Is material on elevated surfaces piled, stacked or racked in a manner to prevent it from tipping, falling, collapsing, rolling or spreading?

### **Emergency Equipment**

Are eye wash fountains and safety showers provided in areas where corrosive chemicals are handled?

Are eye wash fountains and safety showers readily accessible clearly marked, properly maintained, and inspected and tagged?

### **Emergency Preparedness**

Are shut-off valves marked and easily accessible? Are tools readily available to turn off natural gas shut-off valves?

### **Employer Posting**

Are emergency telephone numbers posted where they can be readily found in case of emergency?

Are hazard warning signs and tags used where there are immediate dangers or potential hazards? Are caution and information signs used where there are potential hazards or need for general instructions? Are obsolete signs promptly removed?

Are building and trailer identification numbers posted on exterior? Are room numbers readily visible?

Are signs concerning exiting from buildings, room capacities, floor loading, exposures to x-ray, microwave, or other harmful radiation or substances posted where appropriate?

Do occupants know the location of the assembly area(s) and evacuation route(s)?

### **Energy Conservation**

Are there loose windows, non-closing doors, holes in outside walls, and other building deficiencies which result in excess use of energy?

Is inefficient use of energy caused by heating large areas when spot heating would be sufficient, lighting unoccupied areas, etc., avoided?

Where space heating is inadequate, have all work areas (fixed and occupied) been provided with spot heating?



Are the controls of hoist plainly marked to indicate the direction of travel or motion?

Are the Daily Inspection Tags for Hoist/Crane and Secondary Lifting Equipment completely filled out for each day of operation?

Is each pendant cable tagged with an LBNL "Warning to Avoid Injury" tag?

Is there an LBNL Proof Load Tag on the Hoist? Does the load limit on the tag match the marking on the hoist?  
Is the rated load of each hoist legibly marked and visible to the operator?

### **Identification of Piping Systems**

Is tubing or piping material appropriate for the type of material it contains, e.g., no copper for acetylene gas?

Are pipelines carrying hazardous substances identified by tags? Are the tags constructed of durable materials? Is the message carried clearly and permanently distinguishable? Are tags installed at each valve or outlet?

### **Industrial Trucks (Fork-Lifts)**

Are daily inspections of tires, lights, battery, fuel, steering, hydraulics, forks, brakes conducted?

Are forklift trucks tagged for maintenance when there is a malfunction?

Are keys removed from the ignition when the lift truck is unattended?

Are load capacities and centers of gravity (24" from mast) observed?

Are the brakes on each industrial truck capable of bringing the vehicle to a complete and safe stop at any time?

Does each industrial truck have a warning horn or other device which can be clearly heard above the normal noise in the areas where operated?

Is the speed limit for industrial trucks appropriate for load and road conditions?

When ascending or descending a grade 10% or more, are loads carried/transported upgrade?

When forklift trucks are left unattended, are the forks lowered, controls neutralized, hand brake set, and wheels chocked if on a ramp or incline?

Will the industrial truck's parking brake effectively prevent the vehicle from moving when unattended?

## **Ladders**

Are all ladders maintained in good condition, joints between steps and side rails tight, all hardware and fittings securely attached and movable parts operating freely without binding or undue play?

Are ladder rungs and steps free of grease and oil and are non-slip safety feet provided on each ladder?

Are only approved ladders or step stools in use?

Is it required that the base of portable rung or cleat type ladders be placed so that slipping will not occur? If conditions do not permit proper placement, is the ladder lashed or otherwise held in place?

Are portable metal ladders legibly marked with signs reading "CAUTION - Do Not Use Around Electrical Equipment" or equivalent wording?

## **Lead Exposure**

If lead-containing materials are melted (via soldering, casting, etc.) during work procedures, has the Industrial Hygiene Group evaluated the airborne lead levels?

If painted lead objects (excluding material used for shielding) are present in the work place, has the Industrial Hygiene Unit evaluated the airborne lead levels?

## **Lifting/Loading**

Are tote box loads less than 50 lbs.? Are heavily loaded tote boxes labeled to indicate excess weight?

## **Lockout/Tagout Procedures**

Are lockout tags affixed properly to all defective equipment not otherwise secured against use?

## **Machine Guarding and Safety**

Are all emergency stop buttons colored red?

Are all pulleys, belts, gears, shafts, and moving parts that are within 7 feet of the floor or working level properly guarded?

Are machine guards secured and arranged so that they do not offer an accident hazard in themselves?

Are power and operating control switches within easy reach of the operator while at the regular work position (no need to reach over cutter to make adjustments)?

Are splash guards mounted on machines that use coolant to prevent the coolant from reaching employees?

Are switches, including foot-operated switches, guarded or arranged to prevent accidental actuation by personnel or falling objects?

Do arbors and mandrels have firm and secure bearings and are they free from play?

Does machine guarding (e.g. barrier guards, two-hand tripping devices, electronic safety devices, etc.) protect employees in the machine area from hazards created by the point of operation, ingoing nip points, rotating parts, flying chips, and sparks?

Is sufficient clearance provided around and between machines to allow for safe operations, set up and servicing, material handling and waste removal?

On each machine operated by electric motors, is there a positive means to render the controls or devices inoperative (e.g. lockout power) for maintenance, repair, or security?

Are fan blades protected with a guard having openings no larger than 1/2 inch, when operating within 7 feet of the floor or working level?

## **Maintenance Management**

Is preventive maintenance performed efficiently and within prescribed time limits?

### **Material Handling**

When hoisting material or equipment, are provisions made to assure that no one will be passing under the suspended loads?

Are Material Safety Data Sheets available to employees who handle or may be exposed to hazardous substances?

Are materials stored above 6 feet in height secured or contained so that individual articles cannot fall?

Are storage racks internally braced and secured to prevent tipping?

Do employees always wear gloves and safety glasses or protective goggles while handling metal banding?

### **Occupational Noise**

Has the Industrial Hygiene Unit been contacted to arrange for noise monitoring if background noise makes it impossible to conduct a normal conversation without shouting?

### **Personal Protective Equipment/Clothing**

Are approved safety glasses, with side shields, required to be worn at all times in areas where there is a risk of eye injury?

Are disposable dust masks being used only for nuisance dust materials? Is use of disposable dust masks evaluated by the Industrial Hygiene Group (to determine if masks provide sufficient protection)?

Are protective gloves, aprons, shields or other means provided against cuts, corrosive liquids, and chemicals?

Is appropriate foot protection required where there is risk of foot injuries from hot, corrosive, or poisonous substances; falling objects; crushing; or penetrating actions?

Is personal protective equipment easily accessible, maintained in a sanitary condition, ready for use, and stored in an orderly manner?

Are hard hats provided and worn where danger of falling objects exists? Are hard hats inspected periodically for damage to the shell and suspension system?

### **Portable (Power Operated) Tools and Equipment**

Are circular saw guards checked to assure they are not wedged up, thus leaving the lower portion of the blade unguarded?

Are grinders, saws, and other power tools provided with appropriate safety guards?

### **Seismic and General Work Environment**

Is equipment capable of causing hazard if knocked over properly secured? Are wheeled equipment or carts provided with wheel-locks or other method to secure against rolling away?

Are adequate labels present to prevent food or beverages from being stored in laboratory and shop refrigerators or cabinets used for chemical storage?

Are all worksites, restrooms, and washrooms clean and orderly and in a sanitary condition?

Are bookcases, lockers, file cabinets, furniture, and equipment over three feet high secured against falling during an earthquake? Do storage cabinets and file cabinets have securely closing doors or drawers?

Are ceiling panels, overhead light fixtures, and other overhead objects properly secured? Are wall bulletin boards, chalk boards, framed pictures, and window blinds properly secured?

In areas where means of egress could be blocked, are books and other heavy objects prevented from falling off high shelves (lips on bookcase shelves or bungee cords)?

Is storage of heavy items on shelves, tops of bookcases, or tops of file cabinets above 3 feet avoided?

### **Solvent-Based Cleaning Operations**

Is solvent (including waste solvent) stored or disposed of in a manner that will avoid evaporation (i.e., sealed containers) into the air? Is the solvent-based cleaning system cover in place, except when processing work or performing maintenance?

### **Stairs and Stairways**

Are standard stair rails or handrails on all stairways having four or more risers?

Are steps on stairs and stairways designed or provided with a surface that renders them slip resistant?

Where stairs or stairways exit directly into any area where vehicles may be operated, are adequate barriers and warnings provided to prevent employees stepping into the path of traffic?

### **Suspect/Counterfeit Parts**

Are certified high-strength fasteners installed in critical applications marked or identifiable? Are copies of the certification papers available on site.

Are suspect parts being removed, packaged, labeled, delivered to Warehouse 903, and documented following the instructions in the Office of Assessment and Assurance Suspect/Counterfeit Parts Report form?

Have all suspect parts (including high strength fasteners and circuit breakers) been removed from parts stocks?

Is the use of suspect high-strength fasteners in critical applications avoided? If not removed immediately, have they been marked (use red if colored marking) or are they identifiable to indicate that they are to be removed as soon as possible?

### **Ventilation**

Has the performance of each local exhaust ventilation point (e.g., hood) been checked within the last 2 years as indicated by an Industrial Hygiene inspection label on the hood?

### **Walkways**

Are aisles and passageways kept clear and free of tripping hazards?

Are wet surfaces covered with non-slip materials?

### **Waste Discharges**

Are drains labeled with signs indicating that hazardous materials should not be poured down the drain?

### **Welding, Cutting, and Brazing**

Are cables inspected for wear and damage, and exposed bare conductors replaced when needed?

Are employees exposed to the hazards created by welding, cutting, or brazing operations protected with personal protective equipment and clothing? Is it required that eye protection, hand shields and goggles meet appropriate standards?

Are only approved apparatus (torches, regulators, pressure-reducing valves, acetylene generators, manifolds) used? Are oxygen-acetylene systems equipped with the proper check valves and flashback protectors?

Is red used to identify the acetylene (and other fuel-gas) hose, green for oxygen hose, and black for inert gas and air hose?

Is suitable (i.e., dry chemical) fire extinguishing equipment available for immediate use?

When arc welding is to be suspended for any substantial period of time, such as during lunch or over night, are all electrodes removed from the holders and the holders carefully located so that accidental contact cannot occur, and is the machine disconnected from the power source?

When the object to be welded cannot be moved and fire hazards cannot be removed, are shields used to confine heat, sparks, and slag?

## **Team 3 Building 6 Floor & Buildings 2, 6 mezzanine, 10, & 80 Labs**

### **Air Permits**

If an operation, process, or equipment emits either nonradiological substances (toxic or organic) or radionuclides into the air, or if any of the following has changed in the past year or is expected to change in coming year:

- 1) source location,
  - 2) total hours of operation,
  - 3) type of material processed,
  - 4) quantity of material processed annually,
  - 5) addition of an air emissions abatement device,
- has EH&S been notified to determine regulatory compliance requirements?

### **Asbestos Exposure**

Are cement materials that contain asbestos (e.g., transite panels) in good condition?

Is asbestos-containing thermal insulation on plumbing equipment, steam pipes, etc. in good condition (i.e., all exposed surfaces, including ends, are sealed)? **NOTE: Report punctures and deteriorating insulation to the Industrial Hygiene Group**

### **Chemical Labeling and Storage**

Are all chemical containers labeled as to their contents and hazard?

Are chemicals stored in approved containers with, if necessary, secondary containment? Are containers with flammable or toxic chemicals tightly closed and covered when not in use?

Are incompatible chemicals stored separately?

### **Chemical Safety**

Are overhead chemical storage units equipped with seismic guards (such as toe boards, bungee cords, or shelf lips)?

### **Chemical Spill Response**

Are hazardous liquids such as solvents stored and dispensed where they cannot accidentally spill into drains(floor or sink)?

Are spill kits readily accessible?

### **Compressed Gas Cylinders - Storage and Handling**

Are compressed gas cylinders stored in areas which are:

- 1) protected from heat sources such as flame impingement, intense radiant heat, electric arcs, or high temperature lines;
- 2) away from stairs, elevators, and gangways; and
- 3) protected from cryogenic spills (by platforms or barriers)?

Are cylinders legibly marked to clearly identify the type of gas contained?

Are cylinders stored away from stairs, elevators, and gangways in a vertical, valve-end up position to prevent them creating a hazard by tipping, falling, or rolling? Are they secured with at least 2 chains or other devices fastened to a wall rack or other substantial structure?

Are regulators removed and valve-protection caps put in place before cylinders are moved or when cylinders are not in use (or connected for use)? Are cylinder valves closed off before moving cylinders, when the cylinder is empty, and at the completion of each job? Before a regulator is removed, is the valve closed and gas released from the regulator?

Do compressed gas cylinders have appropriate pressure relief devices?

## Electrical

Are 3-wire cord plugs undamaged (no tape), with no removed grounding pins?

Are all electrical raceways and enclosures securely fastened in place?

Are all unused openings (including conduit knockouts) in electrical enclosures and fittings closed with appropriate covers, plugs or plates?

Are clamps (strain reliefs) or other securing means provided on flexible cords or cables at plugs, receptacles, tools, equipment, etc., and is the cord jacket securely held in place?

Are cords and cables free of grease, oil or chemicals unfrayed and free of splices or taps?

Are daisy chains of extension cords and power strips avoided?

Are electrical cords and wires protected from damage?

Are electrical enclosures such as switches, receptacles, junction boxes, etc., provided with tight-fitting covers or plates of approved materials and design?

Are electrical outlets of approved three-wire (grounding) type?

Are electrical panels and breakers properly labeled? Are all disconnecting switches and circuit breakers labeled to indicate their use or equipment served?

Are extension cords:

- 1) equipped with proper cord plugs,
- 2) positioned so they do not create trip hazards,
- 3) not used in place of permanent wiring, and
- 4) equipped with grounding conductors?

Are ground fault interrupters (GFCI's) for 120-volt 15- and 20-amp receptacles installed in wet or damp areas and in receptacles within 6 feet of sinks and fume hood sinks?

Are items of electrical equipment, cords, and connectors maintained in good condition, free from damaged insulation, loose connections, exposed terminals, or loose wires?

Are multiple plug adapters prohibited?

Are oil filled transformers provided with secondary containment in the event of an oil leak?

Are power strips LBNL approved and labeled with the U.L. symbol?

Are receptacles and outlets in good condition (not loose or broken)?

Are space heaters provided with tip-over switch?

Are there no more than 13 convenience outlets on a 20-amp circuit?

Are warning signs posted where employees, other than qualified employees, might come in contact with live parts?

If emergency lighting units are connected by cord and plug, are cords no more than three feet long?

Is permanently located machinery hard wired, unless specifically intended for flexible cord connection per LBNL criteria?

Is sufficient access and working space provided and maintained about all electrical equipment to permit ready and safe operations and maintenance? Is there a 30 inch wide and 3 foot deep clearance maintained around control switches, circuit breakers, and electrical panels?

Is the practice of stringing cords or wiring on pipes, conduit, nails or hooks or across ceilings avoided? Is the practice of running flexible cords and cables through holes in walls, ceilings, or floors avoided?

Is there no more than 13 feet of plug strip on a 20-amp circuit?

### **Elevated Surfaces**

Are all elevated surfaces (beneath which people or machinery could be exposed to falling objects) provided with standard 4-inch toe boards?

Are signs posted, when appropriate, showing the elevated surface load capacity? Are loads on elevated surfaces within posted load capacity?

Is a permanent means of access and egress provided to elevated storage and work surfaces?

Is material on elevated surfaces piled, stacked, or racked in a manner to prevent it from tipping, falling, collapsing, rolling, or spreading?

### **Emergency Equipment**

Are eye wash fountains and safety showers provided in areas where corrosive chemicals are handled?

Are eye wash fountains and safety showers readily accessible clearly marked, properly maintained, and inspected and tagged?

### **Emergency Preparedness**

Are shut-off valves marked and easily accessible? Are tools readily available to turn off natural gas shut-off valves?

### **Employer Posting**

Are emergency telephone numbers posted where they can be readily found in case of emergency?

Are hazard warning signs and tags used where there are immediate dangers or potential hazards? Are caution and information signs used where there are potential hazards or need for general instructions? Are obsolete signs promptly removed?

Are building and trailer identification numbers posted on exterior? Are room numbers readily visible?

Are signs concerning exiting from buildings, room capacities, floor loading, or exposures to x-ray, microwave, or other harmful radiation or substances posted where appropriate?

Do occupants know the location of the assembly area(s) and evacuation route(s)?

### **Energy Conservation**

Are there loose windows, non-closing doors, holes in outside walls, and other building deficiencies which result in excess use of energy?

Is inefficient use of energy caused by heating large areas when spot heating would be sufficient, lighting unoccupied areas, etc., avoided?

Where space heating is inadequate, have all work areas (fixed and occupied) been provided with spot heating?

### **Fire Protection**

Are amounts of flammable and combustible liquids greater than 10 gallons stored in an approved flammable liquid cabinet, storage room, or storage area?

Are Class 1A flammable liquids stored in metal containers with a maximum capacity of 1 gallon or in safety containers with a maximum capacity of two gallons? Are other flammable and combustible liquids stored in containers (metal or safety cans) with a maximum capacity of five gallons?

Are combustible scrap, debris and waste materials (oily rags, etc.) stored in covered metal receptacles and removed from the worksite properly?

Are exit doors and gates maintained to open without a key, tool, or special effort?

Are exit doorways, corridors, stairs, walkways, and aisles kept free of obstructions and combustible materials?

Are fire extinguishers visible and readily accessible? Are extinguishers inspected monthly and have maintenance inspections been performed within the last 12 months (as noted on the inspection tags)?

Are fire sprinkler heads and pipes kept free of decorations, wire, and other materials?

Are heat-producing appliances located at least 18 inches from combustible material?

Are materials stored in a secure and orderly manner?

Are mechanical, equipment, boiler rooms, attics, and unfinished spaces kept free of combustible materials?

Are three foot clearances from extinguishers, hose racks, and system valves maintained?

Are three foot clearances from hydrant or sprinkler connections maintained?

Are work aisles maintained at a minimum 24 inch width and other aisles at a minimum 36 inch width?

Do exit signs contain the word "EXIT" in lettering at least 6 inches high, with the stroke of the lettering at least 3/4 inch wide? Are the signs and exits adequately illuminated?

Is proper clearance of 18 inches maintained below sprinkler heads and two feet below ceilings?

### **Floor and Wall Openings**

Are all floor holes into which persons can accidentally walk guarded either by a standard railing with a standard toe board on all exposed sides or by a floor hole cover that is hinged in place?

Are floor and stairway openings guarded by a cover, a guardrail, or equivalent on all sides (except at entrance to stairways or ladders)?

Are toe boards installed around the edges of permanent floor openings where persons may pass below the opening?

Is every open-sided floor or platform 4 feet or more above the adjacent floor or ground level guarded by a standard railing on all open sides except where there is an entrance to a ramp, stairway, or fixed ladder?

### **Hoist/Cranes and Secondary Equipment**

Are lifting cables labeled?

Are the controls of hoist plainly marked to indicate the direction of travel or motion?

Are the Daily Inspection Tags for Hoist/Crane and Secondary Lifting Equipment completely filled out for each day of operation?

Is each pendant cable tagged with an LBNL "Warning to Avoid Injury" tag?

Is there an LBNL Proof Load Tag on the Hoist? Does the load limit on the tag match the marking on the hoist?  
Is the rated load of each hoist legibly marked and visible to the operator?

### **Identification of Piping Systems**

Are pipelines carrying hazardous substances identified by tags? Are the tags constructed of durable materials? Is the message carried clearly and permanently distinguishable. Are tags installed at each valve or outlet?

### **Industrial Trucks (Fork-Lifts)**

Are daily inspections of tires, lights, battery, fuel, steering, hydraulics, forks, brakes conducted?

Are forklift trucks tagged for maintenance when there is a malfunction?

Are keys removed from the ignition when the lift truck is unattended?

Are load capacities and centers of gravity (24" from mast) observed?

Are the brakes on each industrial truck capable of bringing the vehicle to a complete and safe stop at any time?

Does each industrial truck have a warning horn or other device which can be clearly heard above the normal noise in the areas where operated?

Is the speed limit for industrial trucks appropriate for load and road conditions?

When ascending or descending a grade 10% or more, are loads carried/transported upgrade?

When forklift trucks are left unattended, are the forks lowered, controls neutralized, hand brake set, and wheels chocked if on a ramp or incline?

Will the industrial truck's parking brake effectively prevent the vehicle from moving when unattended?

### **Ladders**

Are all ladders maintained in good condition, joints between steps and side rails tight, all hardware and fittings securely attached, and movable parts operating freely without binding or undue play?

Are ladder rungs and steps free of grease and oil and are non-slip safety feet provided on each ladder?

Are only approved ladders or step stools in use?

Is it required that the base of portable rung or cleat type ladders be placed so that slipping will not occur? If conditions do not permit proper placement, is the ladder lashed or otherwise held in place?

Are portable metal ladders legibly marked with signs reading "CAUTION - Do Not Use Around Electrical Equipment" or equivalent wording?

### **Lead Exposure**

If painted lead objects (excluding material used for shielding) are present in the work place, has the Industrial Hygiene Unit evaluated the airborne lead levels?

**Lifting/Loading**

Are tote box loads less than 50 lbs.? Are heavily loaded tote boxes labeled to indicate excess weight?

**Lockout/Tagout Procedures**

Are lockout tags affixed properly to all defective equipment not otherwise secured against use?

**Machine Guarding and Safety**

Are fan blades protected with a guard having openings no larger than 1/2 inch, when operating within 7 feet of the floor or working level?

**Maintenance Management**

Is preventive maintenance performed efficiently and within prescribed time limits?

**Material Handling**

When hoisting material or equipment, are provisions made to assure that no one will be passing under the suspended loads?

Are Material Safety Data Sheets available to employees who handle or may be exposed to hazardous substances?

Are materials stored above 6 feet in height secured or contained so that individual articles cannot fall?

Are storage racks internally braced and secured to prevent tipping?

Do employees always wear gloves and safety glasses or protective goggles while handling metal banding?

**Occupational Noise**

Has the Industrial Hygiene Unit been contacted to arrange for noise monitoring if background noise makes it impossible to conduct a normal conversation without shouting?

**Personal Protective Equipment/Clothing**

Are approved safety glasses, with side shields, required to be worn at all times in areas where there is a risk of eye injury?

Are protective gloves, aprons, shields or other means provided against cuts, corrosive liquids and chemicals?

Is personal protective equipment easily accessible, maintained in a sanitary condition, ready for use, and stored in an orderly manner?

Are hard hats provided and worn where danger of falling objects exists? Are hard hats inspected periodically for damage to the shell and suspension system?

### **Radiation Protection**

Are all furniture and/or equipment items (including gas cylinders) going from designated Radiological Material Areas to reclamation (salvage) surveyed for radiation and tagged "RELEASE" by EH&S?

### **Seismic and General Work Environment**

Are adequate labels present to prevent food or beverages from being stored in laboratory and shop refrigerators or cabinets used for chemical storage?

Are all worksites, restrooms, and washrooms clean and orderly and in a sanitary condition?

Are bookcases, lockers, file cabinets, furniture, and equipment over three feet high secured against falling during an earthquake? Do storage cabinets and file cabinets have securely closing doors or drawers?

Are ceiling panels, overhead light fixtures, and other overhead objects properly secured? Are wall bulletin boards, chalk boards, framed pictures, and window blinds properly secured?

In areas where means of egress could be blocked, are books and other heavy objects prevented from falling off high shelves (lips on bookcase shelves or bungee cords)?

Is storage of heavy items on shelves, tops of bookcases, or tops of file cabinets above 3 feet avoided?

### **Stairs and Stairways**

Are standard stair rails or handrails on all stairways having four or more risers?

Are steps on stairs and stairways designed or provided with a surface that renders them slip resistant?

Where stairs or stairways exit directly into any area where vehicles may be operated, are adequate barriers and warnings provided to prevent employees stepping into the path of traffic?

### **Suspect/Counterfeit Parts**

Are certified high-strength fasteners installed in critical applications marked or identifiable? Are copies of the certification papers available on site.

Are suspect parts being removed, packaged, labeled, delivered to Warehouse 903, and documented following the instructions in the Office of Assessment and Assurance Suspect/Counterfeit Parts Report form?

Have all suspect parts (including high strength fasteners and circuit breakers) been removed from parts stocks?

Is the use of suspect high-strength fasteners in critical applications avoided? If not removed immediately, have they been marked (use red if colored marking) or are they identifiable to indicate that they are to be removed as soon as possible?

### **Ventilation**

Has the performance of each local exhaust ventilation point (e.g., hood) been checked within the last 2 years as indicated by an Industrial Hygiene inspection label on the hood?

### **Walkways**

Are aisles and passageways kept clear and free of tripping hazards?

Are wet surfaces covered with non-slip materials?

### **Waste Discharges**

Are drains labeled with signs indicating that hazardous materials should not be poured down the drain?

## Team 4

### Building 46 Offices, Labs, and Shops Building 27 Office and Lab

#### **Abrasive Wheel Equipment - Grinders**

Are machines designed for a fixed location securely anchored to prevent movement, or designed in such a manner that in normal operation they will not move?

Do abrasive wheel safety guards cover the spindle end, nut, and flange projections?

Is an adjustable work rest of rigid construction used to support the work of offhand grinding machines? Is the work rest kept adjusted closely to the wheel with a maximum clearance of 1/8 inch?

Is the adjustable tongue or end of the peripheral member at the top of the housing used and kept adjusted to within 1/4" of the wheel?

#### **Air Permits**

If an operation, process, or equipment emits either nonradiological substances (toxic or organic) or radionuclides into the air, or if any of the following has changed in the past year or is expected to change in coming year:

- 1) source location,
  - 2) total hours of operation,
  - 3) type of material processed,
  - 4) quantity of material processed annually,
  - 5) addition of an air emissions abatement device,
- has EH&S been notified to determine regulatory compliance requirements?

#### **Asbestos Exposure**

Are floor tiles in good condition, and not being abraded or scraped as a result of work practices (floor buffing, scraping chairs, machinery vibration, etc.)?

Are cement materials that contain asbestos (e.g., transite panels) in good condition?

Is asbestos-containing thermal insulation on plumbing equipment, steam pipes, etc. in good condition (i.e., all exposed surfaces, including ends, are sealed)? **NOTE: Report punctures and deteriorating insulation to the Industrial Hygiene Group**

#### **Business Services**

Are retirees and students assigned shared office space?

Is all sensitive (attractive) and capital property accurately accounted for?

#### **Chemical Labeling and Storage**

Are all chemical containers labeled as to their contents and hazard?

Are chemicals stored in approved containers with, if necessary, secondary containment? Are containers with flammable or toxic chemicals tightly closed and covered when not in use?

Are incompatible chemicals stored separately?

#### **Chemical Safety**

Are overhead chemical storage units equipped with seismic guards (such as toe boards, bungee cords, or shelf lips)?

#### **Chemical Spill Response**

Are hazardous liquids such as solvents stored and dispensed where they cannot accidentally spill into drains(floor or sink)?

Are spill kits readily accessible?

### **Compressed Gas Cylinders - Storage and Handling**

Are cylinders legibly marked to clearly identify the type of gas contained?

Are fuel-gas cylinders placed with valve end up whenever in use, and liquefied gases stored with the valve end up?

Do compressed gas cylinders have appropriate pressure relief devices?

Are compressed gas cylinders stored in areas which are:

- 1) protected from heat sources such as flame impingement, intense radiant heat, electric arcs, or high temperature lines,
- 2) away from stairs, elevators, and gangways, and
- 3) protected from cryogenic spills (by platforms or barriers)?

Are cylinders stored away from stairs, elevators, and gangways in a vertical, valve-end up position to prevent them creating a hazard by tipping, falling, or rolling? Are they secured with at least 2 chains or other devices fastened to a wall rack or other substantial structure?

Are regulators removed and valve-protection caps put in place before cylinders are moved or when cylinders are not in use (or connected for use)? Are cylinder valves closed off before moving cylinders, when the cylinder is empty, and at the completion of each job? Before a regulator is removed, is the valve closed and gas released from the regulator?

Do compressed gas cylinders have appropriate pressure relief devices?

### **Compressors and Compressed Air**

Are employees prohibited from using compressed air at greater than 30 psi for cleaning purposes?

Are safety glasses required in areas where air guns or nozzles are used?

When using compressed air for cleaning, do employees wear personal protective equipment and ensure that chip guarding is in place?

### **Electrical**

Is restart protection provided in the control device of motors driving machines or equipment which could cause probable injury from inadvertent starting after a power loss?

Are 3-wire cord plugs undamaged (no tape), with no removed grounding pins?

Are all electrical raceways and enclosures securely fastened in place?

Are all unused openings (including conduit knockouts) in electrical enclosures and fittings closed with appropriate covers, plugs or plates?

Are clamps (strain reliefs) or other securing means provided on flexible cords or cables at plugs, receptacles, tools, equipment, etc., and is the cord jacket securely held in place?

Are cords and cables free of grease, oil or chemicals unfrayed and free of splices or taps.

Are daisy chains of extension cords and power strips avoided?

Are electrical cords and wires protected from damage?

Are electrical enclosures such as switches, receptacles, junction boxes, etc., provided with tight-fitting covers or plates of approved materials and design?

Are electrical outlets of approved three-wire (grounding) type?

Are electrical panels and breakers properly labeled? Are all disconnecting switches and circuit breakers labeled to indicate their use or equipment served?

Are extension cords:

- 1) equipped with proper cord plugs,
- 2) positioned so they do not create trip hazards,
- 3) not used in place of permanent wiring, and
- 4) equipped with grounding conductors?

Are ground fault interrupters (GFCI's) for 120-volt 15- and 20-amp receptacles installed in wet or damp areas and in receptacles within 6 feet of sinks and fume hood sinks?

Are items of electrical equipment, cords, and connectors maintained in good condition, free from damaged insulation, loose connections, exposed terminals, or loose wires?

Are multiple plug adapters prohibited?

Are oil filled transformers provided with secondary containment in the event of an oil leak?

Are power strips LBNL approved and labeled with the U.L. symbol?

Are receptacles and outlets in good condition (not loose or broken)?

Are space heaters provided with tip-over switch?

Are there no more than 13 convenience outlets on a 20-amp circuit?

Are warning signs posted where employees, other than qualified employees, might come in contact with live parts?

If emergency lighting units are connected by cord and plug, are cords no more than three feet long?

Is permanently located machinery hard wired, unless specifically intended for flexible cord connection per LBNL criteria?

Is sufficient access and working space provided and maintained about all electrical equipment to permit ready and safe operations and maintenance? Is there a 30 inch wide and 3 foot deep clearance maintained around control switches, circuit breakers, and electrical panels?

Is the practice of stringing cords or wiring on pipes, conduit, nails, or hooks or across ceilings avoided? Is the practice of running flexible cords and cables through holes in walls, ceilings, or floors avoided?

Is there no more than 13 feet of plug strip on a 20-amp circuit?

## **Elevated Surfaces**

Are all elevated surfaces (beneath which people or machinery could be exposed to falling objects) provided with standard 4-inch toe boards?

Are signs posted, when appropriate, showing the elevated surface load capacity? Are loads on elevated surfaces within posted load capacity?

Is a permanent means of access and egress provided to elevated storage and work surfaces?

Is material on elevated surfaces piled, stacked, or racked in a manner to prevent it from tipping, falling, collapsing, rolling, or spreading?

## **Emergency Equipment**

Are eye wash fountains and safety showers provided in areas where corrosive chemicals are handled?

Are eye wash fountains and safety showers readily accessible, clearly marked, properly maintained, and inspected and tagged?

### **Emergency Preparedness**

Are shut-off valves marked and easily accessible? Are tools readily available to turn off natural gas shut-off valves?

### **Employer Posting**

Are emergency telephone numbers posted where they can be readily found in case of emergency?

Are hazard warning signs and tags used where there are immediate dangers or potential hazards? Are caution and information signs used where there are potential hazards or need for general instructions? Are obsolete signs promptly removed?

Are building and trailer identification numbers posted on exterior? Are room numbers readily visible?

Are signs concerning exiting from buildings, room capacities, floor loading, or exposures to x-ray, microwave, or other harmful radiation or substances posted where appropriate?

Do occupants know the location of the assembly area(s) and evacuation route(s)?

### **Energy Conservation**

Are there loose windows, non-closing doors, holes in outside walls, and other building deficiencies which result in excess use of energy?

Is inefficient use of energy caused by heating large areas when spot heating would be sufficient, lighting unoccupied areas, etc., avoided?

Where space heating is inadequate, have all work areas (fixed and occupied) been provided with spot heating?

### **Fire Protection**

Are amounts of flammable and combustible liquids greater than 10 gallons stored in an approved flammable liquid cabinet, storage room, or storage area?

Are Class 1A flammable liquids stored in metal containers with a maximum capacity of 1 gallon or in safety containers with a maximum capacity of two gallons? Are other flammable and combustible liquids stored in containers (metal or safety cans) with a maximum capacity of five gallons?

Are combustible scrap, debris and waste materials (oily rags, etc.) stored in covered metal receptacles and removed from the worksite properly?

Are exit doors and gates maintained to open without a key, tool, or special effort?

Are exit doorways, corridors, stairs, walkways, and aisles kept free of obstructions and combustible materials?

Are fire extinguishers visible and readily accessible? Are extinguishers inspected monthly and have maintenance inspections been performed within the last 12 months (as noted on the inspection tags)?

Are fire sprinkler heads and pipes kept free of decorations, wire, and other materials?

Are heat-producing appliances located at least 18 inches from combustible material?

Are materials stored in a secure and orderly manner?

Are mechanical, equipment, boiler rooms, attics, and unfinished spaces kept free of combustible materials?

Are three foot clearances from extinguishers, hose racks, and system valves maintained?

Are three foot clearances from hydrant or sprinkler connections maintained?

Are work aisles maintained at a minimum 24 inch width and other aisles at a minimum 36 inch width?

Do exit signs contain the word "EXIT" in lettering at least 6 inches high, with the stroke of the lettering at least 3/4 inch wide? Are the signs and exits adequately illuminated?

Is proper clearance of 18 inches maintained below sprinkler heads and two feet below ceilings?

### **Floor and Wall Openings**

Are all floor holes into which persons can accidentally walk guarded either by a standard railing with a standard toe board on all exposed sides or by a floor hole cover that is hinged in place?

Are floor and stairway openings guarded by a cover, a guardrail, or equivalent on all sides (except at entrance to stairways or ladders)?

Are toe boards installed around the edges of permanent floor openings where persons may pass below the opening?

Is every open-sided floor or platform 4 feet or more above the adjacent floor or ground level guarded by a standard railing on all open sides except where there is an entrance to a ramp, stairway, or fixed ladder?

### **Hand Tools and Equipment**

Are all tools and equipment (company, lab, or employee-owned) used by employees at their work place in good condition? Are portable electrical tools and equipment grounded or of the double insulated type or provided with barriers or shields? Are electrical appliances such as vacuum cleaners, polishers, vending machines, etc., grounded?

### **Identification of Piping Systems**

Is tubing or piping material appropriate for the type of material it contains, e.g., no copper for acetylene gas?

Are pipelines carrying hazardous substances identified by tags? Are the tags constructed of durable materials? Is the message carried clearly and permanently distinguishable? Are tags installed at each valve or outlet?

### **Ladders**

Are all ladders maintained in good condition, joints between steps and side rails tight, all hardware and fittings securely attached, and movable parts operating freely, without binding or undue play?

Are ladder rungs and steps free of grease and oil and are non-slip safety feet provided on each ladder?

Are only approved ladders or step stools in use?

Is it required that the base of portable rung or cleat type ladders be placed so that slipping will not occur? If conditions do not permit proper placement, is the ladder lashed or otherwise held in place?

Are portable metal ladders legibly marked with signs reading "CAUTION - Do Not Use Around Electrical Equipment" or equivalent wording?

### **Lead Exposure**

If lead-containing materials are melted (via soldering, casting, etc.) during work procedures, has the Industrial Hygiene Group evaluated the airborne lead levels?

If painted lead objects (excluding material used for shielding) are present in the work place, has the Industrial Hygiene Unit evaluated the airborne lead levels?

### **Lifting/Loading**

Are tote box loads less than 50 lbs.? Are heavily loaded tote boxes labeled to indicate excess weight?

### **Lockout/Tagout Procedures**

Are lockout tags affixed properly to all defective equipment not otherwise secured against use?

### **Machine Guarding and Safety**

Are all emergency stop buttons colored red?

Are all pulleys, belts, gears, shafts, and moving parts that are within 7 feet of the floor or working level properly guarded?

Are machine guards secured and arranged so that they do not offer an accident hazard in themselves?

Are power and operating control switches within easy reach of the operator while at the regular work position (no need to reach over cutter to make adjustments)?

Are splash guards mounted on machines that use coolant to prevent the coolant from reaching employees?

Are switches, including foot-operated switches, guarded or arranged to prevent accidental actuation by personnel or falling objects?

Do arbors and mandrels have firm and secure bearings and are they free from play?

Does machine guarding (e.g. barrier guards, two-hand tripping devices, electronic safety devices, etc.) protect employees in the machine area from hazards created by the point of operation, ingoing nip points, rotating parts, flying chips, and sparks?

Is sufficient clearance provided around and between machines to allow for safe operations, set up and servicing, material handling and waste removal?

On each machine operated by electric motors, is there a positive means to render the controls or devices inoperative (e.g. lockout power) for maintenance, repair, or security?

Are fan blades protected with a guard having openings no larger than 1/2 inch, when operating within 7 feet of the floor or working level?

### **Maintenance Management**

Is preventive maintenance performed efficiently and within prescribed time limits?

### **Material Handling**

Are Material Safety Data Sheets available to employees who handle or may be exposed to hazardous substances?

Are materials stored above 6 feet in height secured or contained so that individual articles cannot fall?

Are storage racks internally braced and secured to prevent tipping?

Do employees always wear gloves and safety glasses or protective goggles while handling metal banding?

### **Occupational Noise**

Has the Industrial Hygiene Unit been contacted to arrange for noise monitoring if background noise makes it impossible to conduct a normal conversation without shouting?

### **Personal Protective Equipment/Clothing**

Are approved safety glasses, with side shields, required to be worn at all times in areas where there is a risk of eye injury?

Are disposable dust masks being used only for nuisance dust materials? Is use of disposable dust masks evaluated by the Industrial Hygiene Group (to determine if masks provide sufficient protection)?

Are protective gloves, aprons, shields or other means provided against cuts, corrosive liquids and chemicals?

Is appropriate foot protection required where there is risk of foot injuries from hot, corrosive, poisonous substances, falling objects, crushing or penetrating actions?

Is personal protective equipment easily accessible, maintained in a sanitary condition, ready for use, and stored in an orderly manner?

#### **Portable (Power Operated) Tools and Equipment**

Are circular saw guards checked to assure they are not wedged up, thus leaving the lower portion of the blade unguarded?

Are grinders, saws, and other power tools provided with appropriate safety guards?

#### **Radiation Protection**

Are all furniture and/or equipment items (including gas cylinders) going from designated Radiological Material Areas to reclamation (salvage) surveyed for radiation and tagged "RELEASE" by EH&S?

#### **Seismic and General Work Environment**

Is a finger guard installed on table top paper cutter?

Is equipment capable of causing hazard if knocked over properly secured? Are wheeled equipment or carts provided with wheel-locks or other method to secure against rolling away?

Are adequate labels present to prevent food or beverages from being stored in laboratory and shop refrigerators or cabinets used for chemical storage?

Are all worksites, restrooms, and washrooms clean and orderly and in a sanitary condition?

Are bookcases, lockers, file cabinets, furniture, and equipment over three feet high secured against falling during an earthquake? Do storage cabinets and file cabinets have securely closing doors or drawers?

Are ceiling panels, overhead light fixtures, and other overhead objects properly secured? Are wall bulletin boards, chalk boards, framed pictures, and window blinds properly secured?

In areas where means of egress could be blocked, are books and other heavy objects prevented from falling off high shelves (lips on bookcase shelves or bungee cords)?

Is storage of heavy items on shelves, tops of bookcases or tops of file cabinets above 3 feet avoided?

#### **Solvent-Based Cleaning Operations**

Is solvent (including waste solvent) stored or disposed of in a manner that will avoid evaporation (i.e., sealed containers) into the air? Is the solvent-based cleaning system cover in place, except when processing work or performing maintenance?

#### **Stairs and Stairways**

Are standard stair rails or handrails on all stairways having four or more risers?

Are steps on stairs and stairways designed or provided with a surface that renders them slip resistant?

Where stairs or stairways exit directly into any area where vehicles may be operated, are adequate barriers and warnings provided to prevent employees stepping into the path of traffic?

### **Suspect/Counterfeit Parts**

Are certified high-strength fasteners installed in critical applications marked or identifiable? Are copies of the certification papers available on site.

Are suspect parts being removed, packaged, labeled, delivered to Warehouse 903, and documented following the instructions in the Office of Assessment and Assurance Suspect/Counterfeit Parts Report form?

Have all suspect parts (including high strength fasteners and circuit breakers) been removed from parts stocks?

Is the use of suspect high-strength fasteners in critical applications avoided? If not removed immediately, have they been marked (use red if colored marking) or are they identifiable to indicate that they are to be removed as soon as possible?

### **Ventilation**

Has the performance of each local exhaust ventilation point (e.g., hood) been checked within the last 2 years as indicated by an Industrial Hygiene inspection label on the hood?

### **Walkways**

Are aisles and passageways kept clear and free of tripping hazards?

Are wet surfaces covered with non-slip materials?

### **Waste Discharges**

Are drains labeled with signs indicating that hazardous materials should not be poured down the drain?

### **Welding, Cutting, and Brazing**

Are cables inspected for wear and damage, and exposed bare conductors replaced when needed?

Are employees exposed to the hazards created by welding, cutting, or brazing operations protected with personal protective equipment and clothing? Is it required that eye protection, hand shields and goggles meet appropriate standards?

Are only approved apparatus (torches, regulators, pressure-reducing valves, acetylene generators, manifolds) used? Are oxygen-acetylene systems equipped with the proper check valves and flashback protectors?

Is red used to identify the acetylene (and other fuel-gas) hose, green for oxygen hose, and black for inert gas and air hose?

Is suitable (i.e., dry chemical) fire extinguishing equipment available for immediate use?

When arc welding is to be suspended for any substantial period of time, such as during lunch or over night, are all electrodes removed from the holders and the holders carefully located so that accidental contact cannot occur, and is the machine disconnected from the power source?

When the object to be welded cannot be moved and fire hazards cannot be removed, are shields used to confine heat, sparks, and slag?

### **Workstation Ergonomics**

Are the worker's feet flat on the floor or supported by a footrest?

Are workstations adjustable and arranged to minimize excessive twisting, bending, reaching and pulling?

Do workers take rest breaks at regular intervals as appropriate to the intensity of the tasks?

Does the location of the keyboard allow the worker's forearms to be parallel to the floor (i.e., at right angles to the spine), and the wrists straight, in line with the forearm?

Have position adjustments wrist rest and/or mouse pad rest been considered if the worker's wrists are resting on a hard or sharp surface?

Is adequate space available for workstation hardware (e.g., VDT monitor, keyboard, mouse/trackball, document holder, wrist rest)?

Is adequate space available under the work surface/table so that the legs, knees and thighs do not rub or hit the work surface, or items stored underneath?

Is the chair adjustable and does it provide proper lower back support?

Is the VDT monitor positioned to avoid glare (e.g. from overhead lights or window light)?

To minimize neck and shoulder strain, is the top of the VDT display screen at or slightly below the worker's eye level; and is the VDT monitor located directly in front of and 18-24 inches from the worker?



**APPENDIX 2**  
**Estimated EHS Support of ALS**  
**from the EH&S Division**

| <b>FUNCTION</b>   | <b>FTE EHS</b> |
|---|----------------|
| Liaison - AHD Reviews Inspections (IFA, Self assess. Consultations, meetings, SAARs etc.)                                 | .09            |
| ALS safety support(electrical safety, Lockout-Tagout, ALS EHS Coordinator Back up, Laser safety)                          | .26            |
| IH Hazard evaluations (including chemical issues, respirators, lead, noise, confined space, air quality, project support) | . 06           |
| ORPS  | .05            |
| Waste (Includes Training and Consultations)   | .01            |
| Matrix - Rad tech support   | 1.00           |
| Matrix - ALS ESH Coord.   | 1.00           |
| <b>Totals:</b>  |                |
| Division Liaison Function   | .09            |
| Safety Support Function:  | .26            |
| Other EH&S Support:   | .12            |
| EH&S Matrix support:  | 2.00           |
| <b>Total</b>  | <b>2.47</b>    |

Appendix 3

**LBNL FY 2001 ISM-Based Division Performance at a Glance**

| <b>Expectation</b>   | <b>Data/Result</b>  | <b>Rating</b>  |
|--|---|--|
| evidence of strong ES&H communication  | documented communication  | satisfactory – green<br>partial – yellow<br>marginal - red   |
| evidence of ES&H accountability for employees and participating guests   | documented in P2R or alternative  | satisfactory – green<br>partial – yellow<br>marginal - red   |
| ISM plan is reviewed and updated annually  | yes/no  | yes – green<br>no - red  |
| evidence resources and funds allocated to address ES&H issues  | yes/no  | satisfactory – green<br>partial – yellow<br>marginal - red   |
| % work with hazard reviews and % authorized work being reviewed within required schedule                           | documented reviews of authorized and medium and low hazard work   | >85% -green<br>>60% <85% - yellow<br><60% - red  |
| chemical inventory updated within past 12 months   | yes/no  | >85% done on schedule – green<br><85% reviewed, but timely support has been sought – yellow<br><85% of reviews performed - red |
| % engineering controls (i.e., fume hoods, biocabinets, gloveboxes) certified/tested, including monitor calibration | units certified, tested or calibrated / total biocabinets, gloveboxes, fume hoods, monitors                     | >85% done on schedule – green<br><85% reviewed, but timely support has been sought – yellow<br><85% of reviews performed - red |
| emergency contact information up to date and reviewed annually   | yes/no  | >85% - green<br>>60%, <85% - yellow<br><60% - red  |
| evidence of an effective ergonomics program  | Division has an active ergonomic prevention program relative to degree of ergonomic hazards present in division | satisfactory – green<br>partial – yellow<br>marginal - red   |
| % authorized work w/o major deficiencies   | RWAs, AHDs, etc, without major deficiencies / total RWAs, AHDs, or other authorized work                        | <i>regulatory driven</i><br>>90% green<br>>75% <90% yellow<br><75% red   |
| % SAAs in compliance   | SAAs without deficiencies / total SAAs  | <i>regulatory driven</i><br>>90% green<br>>75%, <90% yellow<br><75% red  |
| % QA compliance rate   | % waste samples analyzed that pass  | <i>regulatory driven</i><br>>95% or only 1 failure – green<br>>92% ,<95% - yellow<br><92% - red                                |

| <b>Expectation</b>   | <b>Data/Result</b>  | <b>Rating</b>  |
|--|---|--|
| # NCARs  | number of NCARs   | <i>regulatory driven</i><br>0 – green<br>type 1 - yellow<br>any type 2 - red   |
| Injuries and accidents data  | number of DOE reportables   | <i>contract driven</i><br>TRC >25% below 3.0 or 20% improvement or 1 case/yr. – green<br>TRC <25% below/above 3.0 or 10% improvement or 2 cases/yr. – yellow<br>>25% above 3.0 - red |
| % completion of JHQ or equivalent system   | Rates from training database  | >85% green<br>>60%, <85% yellow<br><60% red  |
| % completion rate of required courses  | rates from training database  | >85% green<br>>60% <85% yellow<br><60% red   |
| % completion or emergency response training  | rates from training database  | >85% green<br>>60% <85% yellow<br><60% red   |
| % wastes reduction   | Division meets division-specific waste minimization goals, as agreed to with Waste Management Group | satisfactory – green<br>partial – yellow<br>marginal - red   |
| % work space inspected   | inspection of space / total space   | >85% green<br>>60% <85% yellow<br><60% red   |
| evidence of management walkthroughs, including division director, department heads, group leads; SAARs completed | yes/no  | satisfactory – green<br>partial – yellow<br>marginal - red   |
| LSAD completion rate   | completed LSADs / total LSADs   | <i>contract driven</i><br>>90% green<br>>75% <90% yellow<br><75% red   |
| evidence of active safety management group or safety committee   | meeting minutes, issue resolutions  | Meet per division ISM plan and issues resolved – green<br>sporadic meetings and unresolved issues – yellow<br>committee not active - red   |

#### Appendix 4 FY 2001 Self-Assessment Performance Criteria

| <b>PERFORMANCE CRITERIA</b> | <b>EXPECTATIONS</b>              | <b>ALS actions to implement expectation)</b> | <b>VALIDATION (for OAA validation)</b> |
|-----------------------------|----------------------------------|--|--|
| <b>Define Work</b>          | <b>1A. Division Director and</b> | <b>1.A.1 Division Director sends</b>         | <b>1.A.1 Annual safety memo.</b>       |

|  |   |   |   |
|--|---|---|---|
| <p><b>The Division integrates ES &amp; H into work and activities.</b></p> | <p>line managers communicate ES &amp; H expectations, goals &amp; policies to all staff. Examples of appropriate communication include: [I, II, IV]*<br/>Annual all-hands division meeting<br/>Research procedures and protocols include safety notes<br/>Availability of safety committee minutes<br/>Division staff has clear lines of communication to convey ES&amp;H issues to Lab and Division management, including evidence of clear policy for all staff to communicate safety concerns.</p> | <p>annual safety memo to all Division employees.<br/><b>1.A.2</b> ALS ESH Committee meeting is held every month. Division management and each group are represented at each meeting. Employee safety concerns as well as lesson learned is discussed at the meeting.<br/><b>1.A.3</b> All ALS employees are assigned to a “safety circle” that meets monthly to disseminate the information as well as the lesson learned passed along in the ALS ESH Committee meeting.<br/><b>1.A.4</b> The Division director holds at least one annual “all hands” meeting with the ALS staff.</p> | <p>Is maintained in the ALS ES&amp;H office<br/><b>1.A.2</b> ALS ES&amp;H/QA Committee meeting agendas and minutes maintained in the ALS ES&amp;H office and on the ALS safety web page.<br/><b>1.A.3</b> Copy of attendance to the Annual all-hands meeting as well as the agenda in maintained in the ALS ES&amp;H office<br/><b>1.A.4</b> The safety performance and the training profiles of all ALS staff are reviewed s part of the P2R process.<br/><b>1.A.5</b> For each experiment performed at the ALS, there is an Experiment Summary Sheet (ESS) describing the safety envelope for the experiment. The ESS is signed by the experimenter in charge and the pertinent ALS/EHS staff and serves as a contract. The ESS is posted at the beamline where the experiment is being conducted.<br/><b>1.A.6</b> Copies of all safety documents and records are kept in the ALS ES&amp;H office.</p> |
|  | <p><b>1B.</b> The ES&amp;H committee and Division safety management group are active in address ES&amp;H for Division</p>   | <p><b>1.B</b> See 1.A.3-6</p>   | <p><b>1.B</b> See 1.A.3-6</p>   |
|  | <p><b>1C.</b> Demonstrate that participating guests are made aware of and held accountable for ES&amp;H.</p>  | <p><b>1.C.1</b> ALS provides all users with site-specific safety training as well as the GERT brochures.<br/><b>1.C.2</b> See 1.A.5</p>   | <p><b>1.C.1</b>Records maintained on the LBNL Training Database.</p>  |
|  | <p><b>1D.</b> Division holds employees accountable for ES&amp;H.</p>  | <p><b>1.D</b> ALS supervisors review ES&amp;H performance of employees and comment on performance of matrixed employees as part of the P2R process</p>  |   |

|  |   |  |   |
|--|---|--|---|
|  | <p><b>1.E</b> The Division has an approved and validated ISM plan.</p>  | <p><b>1.E.1</b> The Division has an approved ISM Plan in place.<br/><b>1.E.2</b> The Division ISM Plan is reviewed at least annually and updated as necessary,</p>   | <p><b>1.E.1/2</b> Copies of signed and dated ISM plan maintained in the ALS ES&amp;H office and on the ALS web page.</p>  |
|  | <p><b>1.F</b> Adequate funds and resources are allocated for controls of EH&amp;S hazards.</p>  | <p><b>1.F</b> ES&amp;H is built in to each project, and all LSAD's submitted to facilities includes an ALS account number.</p>   | <p><b>1.F</b> Facility budgets are available electronically on the LBNL budget page. In the last fiscal year, ALS 142K on general user safety; 25K of that on user electrical safety. In addition, ALS spent 26K on staff safety; including 10K on staff ergonomic equipment.</p>   |
| <p><b>Identify Hazards</b></p> <p><b>Line management evaluates work (new and modifications) to identify hazards before work is performed and to establish authorization for performing work safely.</b></p> <p><b>Line management systematically evaluates hazards to mitigate risk posed by work in their area.</b></p> | <p><b>2A.</b> Line managers use Chapter 6 of PUB 3000 or equivalent for evaluating hazards and necessary authorizations for doing work safely. All appropriate authorizations have been issued.</p> | <p><b>2.A.1</b> Designated project participants complete AHD's or HEAR Client Input Forms* for new experimental activities and modifications to experiments, which add new hazards or increase the level of hazards. Program ES&amp;H Coordinator provides a copy to the Division Head of Operations<br/><b>2.A.2</b> Work not requiring formal EH&amp;S authorizations is authorized by identification of hazards in the HEAR database and identification of appropriate training in Training Profiles. Hazards inventory for all ALS workspaces is reviewed and updated annually.<br/><b>2.A.3</b> For all projects requiring AHD's, Division review and approval will be obtained before project start-up. The Division will review AHD's for active projects annually or when changes in hazards or controls are anticipated.</p> <p><b>2.A.4</b> New and modified beamlines at the ALS are reviewed and authorized by the Beamline Review Committee in accordance with Procedure BL 08-16.<br/><b>2.A.5</b> To conduct research at the ALS, lead researchers must</p> | <p><b>2.A.1 &amp; 3</b> Current AHD's forms are in file in the ALS safety office. And posted at the work area for all products requiring AHD's.<br/><b>2.A.2</b> Hazard inventory information is maintained on the HEAR database. Training profiles are maintained in the EH&amp;S Training database.<br/><b>2.A.4 &amp; 5</b> Current AHD's Beamline safety reviews are in the ALS Experimental Systems Group files. Experiment safety reviews and AHD's are maintained in ALS ES&amp;H office and posted at each experiment Current Sealed Source Authorizations are on file in the ALS ES&amp;H office and maintained at the work area for all projects requiring SSA's.</p> |

submit an ALS Experiment Form describing the experiment and all potential hazardous materials and equipment to be used at the ALS. The research team is offered the ALS Hazard Guide Assessment Table and support from ES&H professionals to successfully complete this submission. This information is used by the ES&H technical and professional review team to generate an Experiment Summary Sheet (ESS). The ESS is the work authorization and specifies the controls, operating conditions, and training needed to conduct the research within the authorized parameters. Authorizations needed from the EH&S Division (Radiation Work Authorization, Sealed Source Authorization AHD) are triggered by this process and become part of the ESS. The signatories on the ESS (Experiment Certification page) include the technical and professional reviewers, the ALS ES&H Coordinator, the Beamline Scientist, and the Experimenter in Charge. A current, fully signed ESS must be posted in the workplace.

**2B.** Division maintains an inventory of its hazardous chemicals. [VII]

**2B.** ES&H Division performed a chemical inventory for the ALS during FY2001

**2B.A** current chemical inventory is located on the ES&H database.

**Control Hazards**  
  
**Administrative and engineering controls tailored to the hazards have been implemented.**

**3A.** Certification of engineering controls and safety instrumentation are up to date. [V]

**3.A.1** Line Management ensures lab and shop safety ventilation systems and required monitors under their control are checked, serviced, calibrated and/or certified as required by PUB-3000, work procedures and manufacturers' recommendations.  
**3.A.2** Where applicable, QUEST teams check engineering controls, safety instrumentation, and suspect/counterfeit parts in their areas at least annually.

**3.A.1.1.** EHS updates the certification stickers when they certify fume hoods annually.  
**3.A.1.2** Documentation of calibration and maintenance on radiation monitors maintained by the site EHS.  
**3.A.1.3.** Documentation of equipment inspection and servicing maintained in the electronic maintenance office.

**3B.** Emergency contact information is appropriate for the work and associated hazards.

**3.B.1** QUEST teams review emergency contact signage and posting in their areas at least annually.

**3.B.1.** Signage and postings are reviewed by the quarterly walkthroughs by the EHS coordinator and AFRD EHS administrator; the tracking of the findings from these walkthroughs is maintained in the AFRD EHS administrator files.

**3.B.2** As part of the annual self-assessment, the ALS staff reviews all posting and signage during their QUEST inspections. Any findings from these reviews are referred to the ALS EHS coordinator and are tracked on the AFRD EHS administrator files.

**3C.** Line managers ensure that ergonomic issues are effectively addressed for their workstations and/or work processes. [V, VI]

**3.C.1** Ergonomic issues are reviewed by the quarterly walkthroughs by the EHS coordinator and AFRD EHS administrator, as well as part of the QUEST inspections. The tracking of the findings from these walkthroughs are maintained in the AFRD EHS administrator files

**3.C.2** A special account has been designated specifically for staff ergonomic equipment

**3.C.3** Copies of ALS ergonomic evaluations are maintained by the EH&S ergonomic evaluator.

## Perform Work

Work is consistently performed within authorization.

Work is conducted in manner that protects the worker, the public and the environment.

## Line management

**4.A.1** Supervisors identify hazards and take actions necessary to reduce the rate of accidents and occurrences. All personnel report accidents and occurrences as required by PUB-3000.

**4.A.2** Hazardous waste generators assigned custodianship of Satellite Accumulation Areas (SAA's) maintain them in accordance

**4.A.1** Accident reports (SAR's) maintained by EH&S and in Division Office. Accident statistics reported by EH&S. Occurrence Reports maintained by EH&S and in Division Office.

**4.A.2** % compliance for SAA's determined by EH&S inspection; %QA waste samples and number

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|---|--|--|---|
| <p>ensures that staff possesses the proficiency and knowledge commensurate with conducting their assigned work safely.</p>  |  | <p>with Guidelines for Generators, PUB-3092. Generators maintain control of SAA's, categorize and label wastes properly, and request pick-up by EH&amp;S before accumulation time limits are exceeded.</p>   | <p>of NCAR's reported by EH&amp;S waste management.</p>   |
|   |  | <p><b>4.B.</b> Supervisors review Training Profiles and training records with employees during P2R period and when duties change significantly.</p>  | <p><b>4.B.</b> Training profiles and completion rates are maintained in the LBNL database.<sup>4C</sup> The emergency team training is maintained in the LBNL group training database.</p>  |
|   |  | <p><b>4.C.</b> Supervisors review Training Profiles and training records with employees during P2R period and when assigned to Building Emergency Team.</p>  |   |
|   | <p><b>4D.</b> Stewardship: waste minimization performance goals are met or exceeded (goals determined by EH&amp;S Waste Management Group, in consultation with the Division).</p>  | <p><b>4.D.1</b> Division ES&amp;H Coordinator meets with EH&amp;S generator assistance specialist and distributes waste minimization performance information received from EH&amp;S at Division safety meetings. Generators identify and implement appropriate waste minimization efforts.</p> | <p><b>4.D.1</b> Waste minimization performance information (% reduction of hazardous waste and non-hazardous solid waste) maintained by EH&amp;S.</p>   |
| <p><b>Feedback and Improvement</b></p> <p><b>Line management actively participates in corrective action planning and ensures that plans are effectively executed.</b></p> <p><b>Divisions implement improvements based on feedback from self-assessment, lessons learned, benchmarking, Appendix F and other vehicles that promote continuous</b></p> | <p><b>5A.</b> Based on the work, associated hazards and safety performance, line managers &amp; staff Including the head of operations, principal investigators, and senior/mid managers, participate in walkthroughs and other ES&amp;H activities.</p> | <p><b>5.A.1</b> AFRD Division ES&amp;H Administrator and the Division Safety Coordinator walk through all ALS workspaces at least annually.</p> <p><b>5.A.2</b> All ALS personnel (except short-term) participate in QUEST activities.</p>   | <p><b>5.A.1</b> Quarterly walkthroughs are by the EHS coordinator and AFRD EHS administrator, as well as part of the QUEST inspections. The tracking of the findings from these walkthroughs are maintained in the AFRD EHS administrator files.</p> <p><b>5.A.2</b> As part of the annual self-assessment, the ALS staff reviews all ALS areas during their QUEST inspections. Any findings from these reviews are referred to the ALS EHS coordinator and are tracked on the AFRD EHS</p> |

improvement.

administrator files.

**5B.** Supervisor's Accident Analysis Reports (SAARs) are processed in a timely manner and actively involves root cause analysis and corrective actions by the injured employee, the supervisor, the safety coordinator, the division liaison, and as appropriate the Division Director and/or other senior managers.]

**5.B** Injured employees, their supervisors, the safety coordinator, the EH&S liaison, and as appropriate the Division Director and/or Program Head participate in accident analyses. Supervisors ensure SAARs are processed in a timely manner.

**5C.** Division tracks the corrective actions of findings identified in its self-assessment.

**5.C** AFRD ES&H Administrator maintains spreadsheet of ES&H action items. Unresolved items over 60 days are entered into the LSAD database.

**5.C.** ALS Action Item spreadsheet maintained by the AFRD Division EH&S Administrator who also maintains the. LSAD database.

**5D.** Division ES&H committee and/or the Division safety management group uses ES&H data and information from lessons learned, SAARs, incident reports, EH&S monitoring reports, Appendix F performance measures, etc. to institute appropriate mitigation measures or opportunities for improvement

**5D** The ALS EHS Committee meets once a month to discuss lessons learned, accidents, and any other safety issues or information deemed important by management or ALS staff. The information from this meeting is then passed to individual safety group meetings (QUEST Teams/safety circle meetings).

**5.D.1** ALS EHS Committee meeting minutes are maintained in the ALS safety office and posted on the ALS Safety Web page.  
**5.D.2** the ALS Quality Assurance officer and the AFRD safety administrator maintain Division QUEST Teams/ safety circle meeting minutes in the EHS safety office and electronically.



- I. Line Management Accountability
- II. Clear Roles & Responsibilities  
Authorization
- III. Competence Commensurate with Responsibilities  
Being Performed
- IV. Balanced Priorities

- V. Identification of Safety Standards
- VI. Requirements and Operations
- VII. Hazard Controls Tailored to Work